



SATURDAY, JUNE 28, 1873.

Electric Semaphore Block-Signaling Apparatus.

This apparatus is the invention of Mr. Frank Russell, of London, and the following description was communicated by the inventor to *Iron*, and published in the number for April 12, 1873:

The application of the electric telegraph for the purpose of signaling trains on railways is so well known that it is not our purpose to enter into any superfluous inquiry as to its origin and progress, but simply to illustrate and explain the particular system here described.

Of late years railway traffic has been so much developed that the necessity for the "block" system—i. e., that two trains or engines are not to be allowed to run on the same section of line at the same time—is thoroughly recognized and is being rapidly developed. The system of signaling from station to station is now the rule, instead of being, as heretofore, the exception. The great object in block-signaling should be to assimilate as closely as possible the electric signals with the signals exhibited to the drivers on the line. By this means they are readily understood, and mistakes are much less likely to occur.

For this purpose an electric semaphore block-signaling instrument has been devised by the author. The apparatus consists of a case in which the works are contained, having on the top a miniature post, made in brass, 18 inches high, on which are mounted one, two or more semaphore arms, disks, or cross arms, as occasion may require. Thus it will be seen that the apparatus may be modified to the requirements of any line. These arms or disks are painted red and white, similar to the arms of the outdoor signals. On the top of the case, in front of the column, is a switch or spring lever, working in a quadrant precisely similar to the quadrant placed in the signal-box, which serves to throw the battery current into the line wire. The spring on this lever is sufficiently strong to prevent any accidental movement. In the front of the instrument is a tapper, or ringing-key, for sounding the bell at the other station. The bell is contained in the lower part of the case.

By combining the whole of the works for both lines of road and the bell signal in one case, we consider that the arrangement for block signaling is very materially simplified, there being always an objection to the use of numerous pieces of apparatus. The same signals are used to denote "line blocked" and "line clear" as are actually exhibited to the driver of the train. In its normal position the instrument denotes "line block," that is, with the arms up. So long only as a current is caused to flow from the battery to the line will the arm fall to "all clear," because the moment the current is cut off, from any cause, the arm flies up to danger, the whole apparatus being in equilibrium. It is, therefore, manifest that it is impossible to lower the red arm except by the action of the electric current, or to maintain that safety signal except by the constant effect of the battery at the other station; and, therefore, as the red arm can only be lowered from the station toward which the train is approaching, the signal must be under the sole control of the signal-man at that station.

As before observed, the position of the arms is the same as seen on the out-door signals, consequently if a signal-man understands the one he cannot fail to interpret the meaning of the other. The white arm of this arrangement is worked electrically by the switch of its own instrument, and shows the signalman the position in which he has placed the electric signal at the other station. In this arrangement three wires are employed for the bell signals and arms for a pair of roads.

Some instruments have been devised in which only one wire is used for both roads and bell, but this system cannot be recommended. In cases where three wires are employed, the all-clear signal can only be maintained by an uninterrupted flow of electricity, and the result is that if any accident happen to the instrument or wire the arm immediately flies up to danger. But, on the other hand, if only one wire is made use of, the necessary signals are produced by momentary currents, and the permanence of the signal is due to the residuary magnetism; the result in this case being that no indication is given of any derangement of the instrument or wire, and safety may continue to be exhibited where danger in reality exists. Moreover they are liable to be reversed or demagnetized by lightning and other atmospheric disturbance. With the one-wire system, if the wire breaks down the whole block section is thrown into derangement; but when three wires are employed, if one wire breaks, signaling can be carried on by means of the other wires.

In the case of the junctions, any number of wires in moderation may be attached to one column, or two or more columns may be planted on one case. The electric signals are treated precisely the same as line signals, namely, constantly main-

tained at danger except when taken off for the purpose of admitting a train.

The switch levers are fitted with a very ingenious arrangement for locking, so that the movement of one switch over to "off" locks all the others over to "on," and thus no branch train can be signaled to enter within a junction section, when the train has to cross the main line metal, so long as a train is signaled on the main line; and when a branch train is signaled as approaching, the main roads that would be fouled by the crossing of the branch train are blocked until that train is clear of the points.

The internal arrangements are very simple. The armature of an electro-magnet is connected with one end of a rocking crank-lever, the other end of the lever being connected with a wire. When the electro-magnet is excited the armature approaches it, depressing one end of the rocking lever and elevating the end in connection with the wire. This wire rises in the hollow column and lowers the arms. Figure 3 shows the perspective elevation of another form of the same apparatus, which is entirely inclosed in a case.

Intermediate semaphores, as they are termed, are for level crossings, etc., where there is a gate-keeper. These instruments are not provided with batteries, ringing-keys or switches; the gate-keeper, therefore, has no power to send a signal; but

this purpose, but only a few yards of wire, and when the line is again clear they would be able to restore the arms to their previous position. In this case the normal position of the arms would be at "all clear." This apparatus has been designed to place telegraphic train-signaling on its proper footing, to provide an instrument meeting all the varied requirements for lines of railway, and to demonstrate to railway authorities what a power to expedite traffic, secure safety and instill confidence may be obtained by an extension in the use of telegraphic train-signals. The principle and mode of action of these instruments may be seen at Messrs. F. Russell & Co., No. 2 Tabot court, Gracechurch street, London, E. C., and Chippenham Mews, Harrow Road, London, W., England.

Contributions.

Confession of a Deadhead.

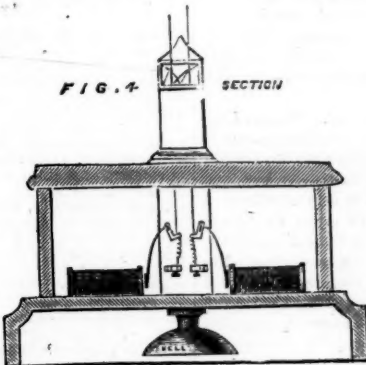
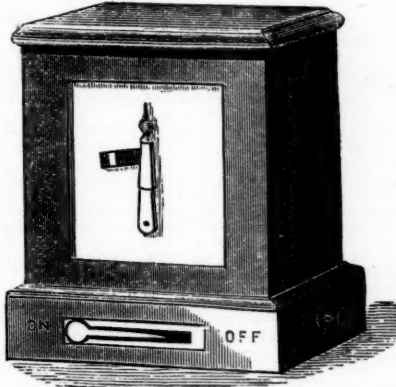
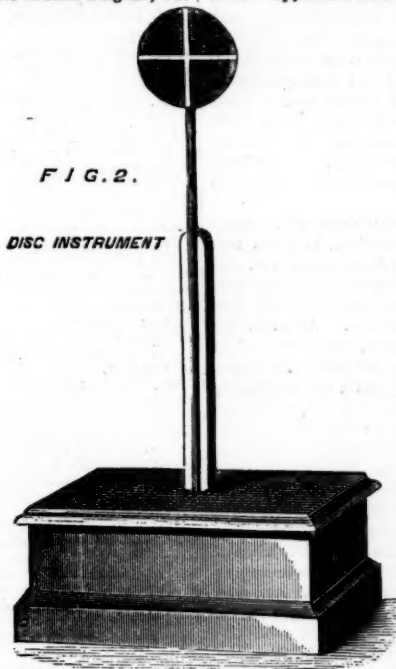
TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read with delight and amusement your editorial entitled "Applicants for Passes." You divide the applicants for free railroad passes into four classes: clerical, charitable, official and journalistic, and give specimens of their begging letters. To the latter class I belonged. I put ashes on my head, and smite my breast and cry "peccati!"

Many years ago I was a youth on my father's farm, and "fed my flocks upon the Grampian hills, a simple swain;" but in an evil day I quitted it and went and joined myself to publicans and sinners. I became an attaché of an influential daily newspaper. My first experience was on being dispatched to the front as "our own correspondent." The veteran river editor went and saw the captain of the steamboat which was to convey me, and to my wondering surprise and delight, that exalted official and pearl of all gentlemen not only received me with distinguished courtesy, placed me by his side at table, and embraced many occasions to converse with me during the trip, but when I offered him my passage money he assured me it was "all right," and seemed almost offended. I was penetrated with gratitude. I was overwhelmed with a sense of undeserved distinction; as if I were a person of mighty consequence. As N. P. Willis says, "I felt that this captain had been the first man to appreciate me, to perceive my unobtrusive worth." In writing a little account of the voyage, how could it have happened otherwise but that I should several times have made favorable mention of the Bayou Belle No. 2, when it was not absolutely necessary for the purposes of history?

But the Confederates did not make the invasion that was contemplated and I was recalled home, and for several weeks I walked or ran up and down the streets in feverish pursuit of items as to how the latest runaway occurred, and how some son of a sea cook quarreled with his neighbor and shot him in the abdomen. Not once did I think of riding in the horse cars except on occasions of profound leisure, and then I always paid for my ride, as a matter of course, out of my slender weekly wages. But on New Year's Day there came to the office a complimentary ticket for each member of the editorial staff, over every horse-car route in the city. It was not—alas! it must be admitted—in the average editorial (or other human) nature to decline receiving them. The editor, and especially the city reporter, rises extremely late in the day, and for an hour is oppressed with an intolerable languor and astigude. A horse-car ride (in the middle of the forenoon, when they go empty) is grateful to him, and is often the highest luxury his constitutionally impecunious condition

will allow. He is bound to a police station in the extremest suburbs of the city, and it would be cruelty to compel him to walk. The free horse-car ticket is a sore temptation to him; he uses it, of course. The car runs over some poor little, houseless, barefoot vagabond, one of the wafes of a great city, and crushes him into a lifeless, bleeding mass. It is a most piteous and saddening spectacle. It is directly the fault, we will suppose of a brutal and reckless driver, but remotely, though none the less surely, of a heartless company who overwork that driver until the loss of sleep makes him callous, sullen, imbruted. In his undisciplined ignorance and the yet unchooled freshness of his sympathies, the reporter writes an account of the occurrence, placing the onus of blame upon the shoulders where it belongs.



ELECTRIC SEMAPHORE BLOCK-SIGNALING APPARATUS.

the instruments are so connected up in the circuit of the block-signaling wires that every signal passing between the station on either side moves the arms of the intermediate instrument; and when provided with a bell, warns the gateman in language that cannot fail to be heard, seen and understood, of the trains, either up or down, which may be approaching, so that he may close the gates against road traffic.

It will be readily understood from the foregoing that the interior mechanical arrangements and method of working these instruments are precisely the same; they differ only in external form. Other applications of the instrument will readily suggest themselves, and will be found exceedingly useful at large goods depots and sidings where shunting is continually going on.

These semaphore instruments may be so constructed as to be perfectly at the command of the plate-layers on the line. Should either or both lines be interrupted, they would be able to ring the signal-bell and put up the red arm against trains in either or both directions. No battery would be required for

He feels a sentiment of just and strong indignation, and gives that sentiment utterance. But the editor-in-chief is wiser than his rash lieutenant. He has an eye to business. He is looking forward to the next New Year's Day and the distribution of passes. When his subordinate's proof-sheet is sent down to him he carefully reads it over and "cuts" certain passages. He mollifies the phrasing so that it will bring the company no scath. The boy is dead, and was a nuisance at best, but the company lives and will have more tickets to distribute. He looks better than his reporter even to his interests, for he knows that without the pass his horse-car fare would devour half his weekly wages. It was a very "melancholy occurrence," of course, but then the boy committed a deplorable mistake in being under the car. All the other lines of the city may prove themselves highly competent, meritorious and watchful in their management throughout the year, and that fact will be duly commented on in the journals; but for this one act of infamous carelessness nobody can be scotched.

After a while the correspondent goes down to the army again. By wrapping himself in a soldier's great coat and riding with them in a cattle car, he contrives to smuggle himself through General Sherman's cordon, and get quite down to the front. The Confederates are making a rapid and daring advance. They concentrate on an outpost held only by a single army corps, and with one fierce onset crush it in and beat it back. So swiftly do they pursue that their advance guard laps our rear by half a mile in the night when they encamp. The Federals escape annihilation with the skin of their teeth, and with the sacrifice of many brave lives.

By means of those occult and mysterious channels of communication known to the newspaper correspondent, he learns that all this happened through the fault of a drunken engineer. He lay in a sotted sleep at a certain station when he ought to have been rattling his engine down lively, carrying the news from headquarters of the Confederate advance. Although he travels on an office pass over that railroad, the correspondent has not fully learned the ways of wisdom. In his letters he makes due mention of the above circumstance. After having liberally praised the company's management in other respects in former correspondence, he considers himself entitled to rasp sharply upon the one heinous offense of retaining such an engineer in service. But his chief again intervenes. He buries the most obnoxious sentences under a long, black, oblivious furrow—*all-nitrum atrum traverso calamo signum*. When the letter appears in print there are suspicious looking thin places in it. The letters straddle far apart, striving to fill up the space, like a line of battle with every other man knocked out of it. The company's feelings might be hurt, and the pass be withdrawn. And they are hurt, notwithstanding the letter had its rough places ironed out. They telegraph to the paper a categorical and ferocious denial of the whole story. In pure self-defense the correspondent reiterates, but this time the whole paragraph is "cut." Thus he is stultified and belied in the eyes of all the paper's readers. At the same time his chief confidentially writes to him: "We have private information concerning the engineer of whom you wrote which confirms your account. But it is not best to stir up a controversy with the Railroad Company. Inclosed find draft for \$200."

Thus railroads do make beggars of us all. Though I inherited from my ancestors, I am proud to believe, as much honesty as falls to the portion of average humanity, for several years I was a dishonest man, made so by the free-pass system. Heaven forgive me for the rides I tried to prig or to beg. I came to regard the pass as my right, as much as did the woman with the "bone frog felon." I considered it one of the perquisites of the reportorial office. I had been educated to look for it and to expect it. If it was not voluntarily tendered I intrigued for it. I carried with me scraps of my best literature. I had my name and the newspaper's name copperplated on highly polished cards.

There is no earthly reason why a newspaper man should receive a pass more than any other person. If his paper cannot live without it, let it die, and the sooner the better. Everybody who knows anything of the inside of newspaper offices knows that those which "pay their way" also pay the best dividends.

As remarked above, for several years I was grievously debauched in my conscience by reason of railroad passes. I haven't got to be quite an honest man yet, but I'm a good deal honest than I used to be. I am honest enough to buy a ticket always before getting aboard, but if the conductor doesn't come along to take it up, I am not going to the smoking-car to look after him. I fully believe and proudly hope that if no railroad company offer me a pass for the next two years, I shall get to be a just and upright man again.

And finally, Mr. Editor, as one who has been the recipient of many free passes, sought or unsought, and who may therefore be considered to speak without envy or jealousy, I give my emphatic indorsement to the advice you offer the railroad companies—"Work out your own salvation." There always will be a lamentable number of sycophants, beggars and whiners in the world, and no action of the companies can ever decrease the number of them; but let them uniformly and rigorously refuse to grant passes, and they will repress their outward manifestations if they do not change their inbred characters.

STEPHEN POWERS.

Fall of the River des Peres Bridge—Correction.

PITTSBURGH, June 21, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Please to give the following a prominent place in your columns.

I have been informed by Mr. J. H. Morley that he was Chief Engineer of the St. Louis & Iron Mountain Railroad at the time the bridge over the River des Peres (which fell January 3, 1873) was built, and that a pile foundation was placed under both piers. In my article of March 26 describing the fall of this

structure, I inferred the absence of such foundation from the evidence I was then able to collect, and gave my deductions accordingly.

CHAS. A. SMITH.

Discussion on Car-Axle Journals.

We give below the full report of the discussion in the Master Car Builders' Association, at Boston, on the report of the Committee on Axles, Journals, Oil-Boxes and Center-Plates, which consisted of Messrs. Kirby, Adams and Hoyt. The report was published in the RAILROAD GAZETTE of March 15 last. It recommended the following specified sizes of journals and axles for all new work, both for passenger and freight service, and also for old cars as far as practicable:

"Length of axle, between outside collars, 6ft. 10in.

"Thickness of collars, 4 inch.

"Diameter of axles at wheel seat, 4 1/2 inches.

"Diameter of axle at center, 4 inches.

"Length of journal, 7 inches.

"Diameter of journal, 3 1/2 inches."

The Chair called for the report of the committee appointed at the last meeting on the subject of Axles, Journals, Oil-Boxes and Center-Plates, the committee consisting of Messrs. Kirby, Adams and Hoyt.

Mr. F. D. Adams, of the Boston & Albany Railroad, read the report of the committee as published in the Car Builder and Railroad Gazette in the month of May last.

Mr. ADAMS—I would like to say, in relation to this, that although I signed this report as one of the committee, I was not myself fully satisfied with it. I was extremely anxious to state to the committee, when this report was made, that I should take the liberty of protesting a little against it myself personally. I am anxious for a larger-sized journal in diameter.

On motion, the report was received.

Mr. I. W. VAN HOUTEN, Pennsylvania Railroad—The convention has now received the report, and we know what the committee recommend; and in order to give the members an opportunity to reflect over this matter, I move that the further consideration of the question be postponed, and made the special order for to-morrow morning at ten o'clock.

After some little discussion the question was put and the motion lost.

Mr. WILLIAM JOHNSON, Erie Railway—This matter has been before the members of the Association in print for three months. It has been in almost all the papers, and every member must have made up his mind on one or two particular points. I think it unnecessary to go into any lengthy discussion upon it, but I would like to hear some remarks from the different gentlemen present. I move that the length and size of axle that the committee have adopted be the standard size of this Association.

Mr. JAMES MCGEE, Pittsburgh, Cincinnati & St. Louis Railway—I would like to ask of the committee recommending this length of axle, if it was made to conform with any large number of trucks now in use, or whether it is a new length entirely? It is a little out of the length to suit a large number of cars with which I am familiar, and I would like to know if there is any other large number of trucks that it will suit—simply the length of axle without regard to the journals?

Mr. F. D. ADAMS—To relieve Mr. McGee's mind on that matter I will simply say that I do not think the committee considered that they were to take into account the length of the axles now used on any particular roads. My own personal opinion in the matter was, that in coming to the conclusion to recommend some size for adoption by the convention, we should utterly disregard any stock that was on the roads, and that was what we wanted to arrive at by our circular; but we did not arrive at it except in a very few cases. We asked the question simply and plainly as it could be put: What would you use for a standard axle if there were no axles in use? Hoping in that way to get at the experience of all master car-builders. We desired them to state in their answers what size they thought would be best, without reference to anything that was already in existence; and in making our recommendation we have fixed upon the length we thought most desirable to have as the standard length, without regard to altering the width of our trucks. But to remove any difficulty that may exist in the mind of any person, I would say that we do not propose to alter any of the trucks now running. We do not recommend that; we do not advise it in any way; but we do propose, if we can establish a standard axle to be universally adopted by all the railroads in the country, to make all axles from the time of its adoption according to that standard, leaving our old stock to run just as long as it will. When those old axles begin to fail, the question will come up at once: How are you going to meet the wants of these old cars? They are not all going to decay at once. The axles are not all going to give out at once. We propose to do it in this way, if we have no axles on hand—and we would not advise any one to make any new ones of that kind—take five cars, for instance, or ten, if it is a large road; take those trucks out, take out the axles and keep them in stock to supply the wants of the old cars, and replace or remodel those trucks and fit them up with the new standard axle. You have then put ten of your old cars into the new standard system, and you will have forty axles to supply your other cars; and continue doing that from year to year until they are all altered over; a few at a time, and at the same time building all our new cars right along upon our standard plan. In this way, we thought we should accomplish the purpose we aim at.

Mr. L. GARET—I have a little statistical information bearing on this subject which it may, perhaps, be advisable to present at this time, as follows:

"The total number of cars on broad and standard gauge steam-roads in the United States and Canada, at the close of the fiscal year in 1871, was:

Eight-wheel cars.....	193,767
Four-wheel cars.....	58,355
	252,122

"There are in the United States and Canada 103 car manufacturing establishments, which have built during the year ending May 31, 1873:

Cars for passenger-trains.....	863
Revenue cars (various).....	35,531
Construction cars.....	371
	36,765

"Cars built by railroad companies during the year ending May 31, 1873:

For passenger-trains.....	644
Revenue cars (various).....	30,465
Construction cars.....	1,396
	22,345

Total.....59,110

"If we add to the above estimates of cars on hand in 1871, and manufactured in 1872-3, half the latter number for the six months intervening between the close of the fiscal year 1871 and the 1st of June, 1872, we shall have a total of 340,667 cars, of all kinds, at the present time, exclusive of narrow-gauge cars."

I have collected this information to show that it would not be so difficult to change the axle as many suppose. If all the new cars that are built from the time the size of the axle has been decided are furnished with that kind of axle, it will take but a very short time to get a great part of our rolling stock equipped with it. I have here some samples of large journals which have been running for some length of time. Here is a

journal on which was laid a very thin coating of lead, and it was placed under a heavy sleeping-car. It was run 27,768 miles, between New York and Buffalo, and you can see what the wear was during that time. It has a bearing for a journal of 4 by 7 inches. I think it doubtful if it would have been possible to run a 5 1/2 by 3 1/2-inch bearing during that length of time without renewing it at least once. I have some other journal-bearings here, one for a 3 1/2 by 6 1/2 journal. I had one or two cars fitted up with a 3 1/2 by 5 1/2-inch journal, and under the same car I placed a 3 1/2 by 6 1/2, and 3 1/2 by 7-inch journal. I had these bearings cast from metal 7 parts copper and 1 part tin, all poured from the same crucible, to be sure that there was no advantage obtained by one over the other. They were placed under cars doing the same service, and had the same attention, and the same lubricator; and I find that in running about 28,000 miles we have displaced from the 5 1/2 by 3 1/2, by friction, 5 pounds from the bearings; from the 3 1/2 by 6 1/2, we have displaced 3 pounds from the bearings; from 3 1/2 by 7 inch, we have displaced 2 1/2 pounds from the bearings. The wear upon the journal has been, on the 3 1/2 by 5 1/2, 1-32 part of an inch; on the 3 1/2 by 6 1/2, 1-64 part of an inch; on the 3 1/2 by 7, 1-100 part of an inch. This appears conclusive to my mind, so far as it goes, that we must have a larger journal than 5 1/2 by 3 1/2 to do our service economically. If we displace 5 pounds from the bearings on a journal 3 1/2 by 5 1/2, and only 2 1/2 pounds from the 3 1/2 by 7-inch journal, if I am not mistaken, it shows that the friction is more on the small journal than on the large. That is, you wear more on the journal, and more on the journal-bearings; and if there is less friction, it certainly must require less power to move the train. I hope there have been other trials of this kind made. I have made these tests very carefully, giving the same attention to all of them.

Mr. F. D. ADAMS, Boston & Albany—I would now like to move an amendment to the motion before us by making the diameter of the journal 4 inches instead of 3 1/2, and, of course, increasing the wheel-seat correspondingly, making 4 1/2 inches finished. It certainly should not be less than this, and I do not know that I should have any objections to making it 5 inches.

Mr. I. W. VAN HOUTEN, Pennsylvania Railroad—I hope this amendment will not prevail. There are two or three questions which it is proper for us to consider before we vote to increase the size of the journal to 4 inches in diameter. The first proper question would seem to be, Who are the great owners of the vast number of cars that have been reported as having been built during the last year by the different railroads of the country? I do not wish to speak disrespectfully of the smaller roads, because we were all small once ourselves; but the question is, Who is it that owns tens of thousands of these cars that have been referred to here as now running in the United States? The next question is, What has been the experience of the gentlemen having charge of that large amount of rolling-stock? And the third question is, What is the size of axle, and the length and diameter of journal now used on these tens of thousands of cars? It appears to me these are three important questions for us to consider. My friend Mr. Garey has exhibited bearings that have been run, as he says, 28,000 miles on a 4-inch journal, and it appears to be, to a certain extent, pretty good evidence that that has been a very good size of journal. But I want to say to you—and when I speak about this thing, I want it to be understood that I speak knowing what I say, so far as that is concerned—that I can produce a car with a journal 7 inches long and 3 1/2 in diameter, which has run 89,590 miles. Then there is another point. I would ask any gentleman in this convention whether in his experience he has ever found an axle to break in the journal, and whether those journals do not run until they are so far worn that they are no longer fit for service, or until the iron becomes crystallized, as scientific men say, so that they are no longer safe? I repeat my question, Did any master car-builder ever know an axle to break in the journal?

Mr. W. E. CHAMBERLAIN, Boston & Albany—If it will be of any accommodation to the gentleman, I can send down to the shop, and I think I can furnish half a dozen.

Mr. C. A. SMITH—I could show him some in the Erie Railway shops.

Mr. VAN HOUTEN—I have never seen one break there unless there had been some neglect, and the journal had become heated. I have seen a good many axles break outside of the wheel. I have seen a good many break inside, the lighter as well as the heavier axles; but I have never known one to break in the journal, unless it had been allowed to run and get heated—the iron burnt off, I might say. I wish to be distinctly understood that my opinion in regard to the size of journals is not influenced by the fact that I happened to be, fortunately or unfortunately, connected with one of the leading roads; but I say that if we should adopt a 4-inch journal, which is larger than one-half or two-thirds of the axles now in use, and which have proved satisfactory, and run with entire success, our action here would amount to nothing. If you could get these parties, whose experience during the last ten or fifteen years tells them that a certain size of axle which they have adopted is a proper size, to throw their tens of thousands of axles away, and adopt a 4-inch journal, it is no use to talk about it. Don't let us go so far on one side that our action here will be of no account. Let us take into consideration, as I said before, all these matters; take into consideration the tens of thousands, and I might say hundreds of thousands almost, of cars that are owned or controlled and run by the large roads. It would be of no use for me to tell the managers of my road that they have made a mistake for fifteen years, and that this Car-Builders' Association has just found it out. They would naturally come back to me and say, "Why, Mr. Van Houten, how happens it that, with your thirty years' experience, you have not found this out before?" I can find cars that have run successfully with journals 2 1/2 by 5 inches, and I have carried hundreds of thousands of passengers. I admit that the cars were much lighter. We build our cars heavier now, but I want the gentlemen to bear in mind one fact, that, while we have increased the weight very materially of our passenger-cars, we have increased the strength and safety of those heavy cars all over the country almost, by using a six-wheel truck. We have three axles with 3 1/2-inch journals to do the work that two axles did before. I consider 3 1/2 by 5 inch journals large enough for all purposes.

Mr. L. GAREY—My impression is, that Mr. Van Houten and some others here may be laboring under a mistake in regard to this matter, and there is one thing in regard to which I would like to know whether I am correct or not. I think this Association has nothing to do with the roads adopting what we recommend here. It is simply the judgment of the members of this Association. They have nothing to do with the question, whether this or that or the other road will adopt their recommendation; but we want to place at this time on record what, in the opinion of the members here, is the best length of journal and size of axle for service on the cars in this country. I think the consideration should be thrown out entirely, whether anybody will adopt it; but we should place ourselves on record, so that if any of us should live fifty years from now, we could look back and say that we were right once in our lives, and not be placed in the position in which some of our learned men are to-day, who were applied to when the electric telegraph was invented, to know if it was safe to run those wires through a city, and gave their opinion that it would be safe to stretch a telegraphic wire across a building of any kind, that it would be sure to be struck by lightning, and every one in it killed! Those men are living to-day, and are at the head of some of our colleges. Now, if they make mistakes, we should not be ashamed to admit that with thirty years' experience, simply practical experience, with very little theoretical knowledge of the matter, we have been in error.

I will admit, any time, that I have been in error, as soon as I am convinced that the fact is so. I hope the gentlemen will not adopt anything because they think the Pennsylvania road, or the Erie road, or the New York Central road, or any other railroad will adopt it, but recommend something that will be right, if it is never adopted. That is my idea of this question.

Mr. J. W. PHILBRICK, Maine Central—I only want to say just this, that I think we are here for a practical purpose. We want to ascertain what is the best thing to be used, and in doing that we want to get the benefit of the experience and wisdom of the Master Mechanics' Association, who had the same subject before them; and when we can combine what we think best and what they think best, we must then, to make it practical, lay the subject before our railroad managers and get them to adopt the standard which we recommend. We know that we are running axles too small, and we are anxious to get something better, and I want our recommendation to be put in such shape that some practical good will result from it. Let us, therefore, take the report which is now before us, and the report of the committee of the Master Mechanics' Association, put them together, and make the best report possible, so that we can present it to the superintendents and managers of the various roads, that we may in the end get something we can use. I move that the committee that is here from the Master Mechanics' Association be requested to present their report. If it is necessary to move to lay the question on the table I will do so; but if that formality is waived, I will move directly that the committee be requested to give their report now.

Mr. I. W. VAN HOUTEN—We are here to transact our own business. I say, with the utmost respect, that we do not ask their report, but I desire that our Committee on Axles may be instructed to confer with the committee from the Master Mechanics' Association. Let them talk over the matter together, and then come in with a joint report.

Mr. W. E. CHAMBERLAIN—I think this Association does want the practical knowledge and experience of the Master Mechanics.

Mr. I. W. VAN HOUTEN—I have not said we did not. On the contrary, I say we do; but I say let us get it by a proper conference between the respective committees.

Mr. W. E. CHAMBERLAIN—I think it is necessary to have it come out here before the convention, so that every member can see what view the Master Mechanics have taken in regard to the matter.

Mr. J. W. PHILBRICK—My only objection is, that if these committees are to come together, it will be necessary for our committee to make up a new report, which would carry the subject along another year. If it could be presented here, and if the matter could be discussed, we could do some work this year which otherwise would have to be postponed until our next session.

Mr. I. W. VAN HOUTEN—I will change my motion to meet the views of my friend, and move that the present committee on car-axles be continued until our next stated meeting, and that during that time they confer and act in conjunction with the committee of the Master Mechanics' Association.

Mr. J. W. PHILBRICK—If that report can be brought in here, and we can have a discussion, then the question before us would be as to recommending a specific size of journal. We are to vote upon that question; and here is another committee who have looked into it, and have something to say upon it, which I think is worthy of attention and should become part of the discussion, and then we shall be ready to vote whether the diameter of the journal shall be 4 inches or something else. We are to vote upon it; that action is to be taken by this meeting, and not by the committee of master mechanics. I do not wish to press it, but that is the reason why I made the motion.

Mr. L. GAREY, New York & Harlem Railroad—I am aware that all the information we can get will not inform us any more than we ought to be informed on this subject. I hope we shall request our committee to confer with the committee from the other Association, that we may have all the information upon this subject that they can give us, and if I get any more than I want, I am willing to distribute it among the members.

The question was then put on the motion to request the committee of the Master Mechanics' Association to read their report, and it was carried.

Mr. M. N. FORNEY, of the Master Mechanics' Association—We were appointed to consider the axle question, but knowing that a committee to consider the same question had been appointed by your Association, our committee thought it would be unwise to recommend any specific size, but that we should request our Association to authorize us to confer with your committee, and we did so. We made a report to that Association, of which the following is a copy:

Mr. Forney then read the report.

Report of the Committee appointed by the American Railway Master Mechanics' Association to investigate the best form and proportions of axles for cars and locomotives. Also whether there is anything to be gained by the use of compound axles and loose wheels.

In order to procure information regarding this subject, the committee to whom it was submitted issued a circular containing the following inquiries:

"1. What are the dimensions of the standard car-axles now used on your road, which please mark on the engraving below?"

"2. When such standard axles break, at what point does the fracture usually occur?"

"3. State, as near as you can, what proportion of breakage of axles of the dimensions given occur close to the hub of the wheel on the inside, and the relative proportion of breakages at other points?"

"4. If there were no car-axles now in use, what size would you recommend for the diameter and length of journal for a universal standard axle for 4 feet 8½ inch gauge roads?"

"What for the diameter at the wheel seat and at the center of the axle?"

"5. What are the dimensions of the driving and truck axles of your most approved locomotives?"

"6. State where the fracture of such axles occur in case of breakage?"

"7. What is your rule for forcing on car and locomotive wheels, that is, how much larger is the axle than the hole in the wheel? And how much is the maximum pressure allowed in pressing them out?"

"8. Have you used any compound axles, or any axles upon which the wheels are loose, or can turn independently one of the other?"

"9. Have you any means of knowing experimentally the difference there is between the resistance of a car or truck with loose and one with tight wheels in passing round curves of any given radius? If so, give the committee a report of such experiments?"

"10. What is your opinion of compound axles or loose wheels?"

To this circular the committee received 31 replies, in some of which the subjects referred to in the inquiries were discussed at considerable length. One of them, written by Mr. Wells, of the Jeffersonville, Madison & Indianapolis Railroad, contains an account of experiments which he made to illustrate the effect of loose and tight wheels on curves, and which, it is thought, has so much value that they recommended that it be read and discussed independent of their report.

The substance of the replies to the first question of their circular, "What are the dimensions of the standard car-axles now used on your road?" they have embodied in the table which is submitted herewith.* Through the Secretary of the

Master Car-Builders' Association, the replies of the members of that society to a committee appointed to consider the same subject were placed at the disposal of your committee. The list of standard axles is therefore more complete than it otherwise could have been made, and embraces those used on about 80 different roads. The great diversity which exists in the size of axles used indicates plainly the importance of taking some action to establish a standard size for universal use.

To the second inquiry, "When such standard axles break, at what point does the fracture usually occur?" nearly all answered that a very large majority of fractures occur just inside the hub of the wheel. Six members answered that they have had no breakages. One reports that breakages are about equally divided between the center of the axle and the part close to the hub on the inside, and the journal nearest to the wheel. Another member reports: "Our iron axle when it breaks does so close to the wheel on the inside of the hub. Steel axles formerly broke at the same point, but the axle was increased in size in the wheel fit from 4½ to 4¾ inches diameter, and since then we have had four to break in the journal at the end nearest the wheel. From late experience I believe that the number of breakages of steel axles in journals and next the hub of wheel is about equal."

A number of replies contain very decided condemnation of the use of sharp corners, and assert that their use is a very prolific cause of fracture.

In reply to the fourth and fifth inquiries, "If there were no car-axles now in use, what size would you recommend for the length and diameter of journal and diameter of wheel-seat and at center for a universal standard axle for 4 feet 8½ inch gauge roads?" eight members recommended 3½ inches for the diameter of journal; one, 3½; fourteen, 3½; one, 3½, and two, 3½ inches. For the length of journal, one recommended 5½ inches; fourteen, 6; two, 6½, and nine, 7 inches.

For the diameter of wheel-seat, three recommended 4½; one, 4 3-16; eleven, 4½; one, 4 5-16; three, 4½; one, 4 7-16; four, 4½, and two, 4½ inches. A similar diversity of opinion exists regarding the size for the center of the axle. These figures are given in a table form herewith.*

The part of the axle subject to the most wear is, of course, the journal. With considerable uniformity in the weight imposed upon the journals, we find nevertheless great want of uniformity in the dimensions of these parts. This seems the more surprising when we consider that very reliable experiments have demonstrated the advantage of some increase in the amount of wearing surface over what was, in early railroad-building, deemed good practice. Take, for example, the experience of the Reading Railroad in 1867. Mr. James Millholland, then residing at Mount Savage, Md., wrote to a member of this convention on this subject, from which letter we extract the following:

"MY DEAR SIR: I have your favor of the 19th inst. As to the advantage of long journal bearings over short ones, for any purpose, there is no doubt. Not my opinion, but my experience has clearly demonstrated that fact."

The Philadelphia & Reading Railroad Company furnishes an express company an eight-wheel car to run between Philadelphia and Elmira, N. Y. When the car was first put on the route, the journals were five and a half inches long and three inches diameter, with a soft-metal bearing, with a strip of brass about an inch wide in it, which rested on the top of the journal. I found that the journals of the axles wore out before the wheels—in fact, they did not last much over one year and were a constant annoyance from heating. To remedy this defect, I put axles under the car with eight-inch journals in length 3½ inches in diameter, and I never knew an instance of their heating. After the car had been run about one year with the long journals, I had one of the bearings removed (it was made in precisely the same manner as the short one) to examine it and the journal, and could see no perceptible wear in either of them."

We do not know of any extended experiments in this country to determine the best proportion of length and diameter of journal under the pressure of a given load. On marine engines, journals have been used under a pressure of 500 lbs. to the square inch, but with universal precaution to insure proper lubrication and an abundant (radiating) surface to dispose of the heat generated by friction. Car-axle journals are, in many instances, subject to a pressure of 380 lbs. to the square inch with only an indifferent condition of lubrication and cleanliness, or freedom from grit. Friction, within the limit of safety from abrasion, is totally irrespective of surface. Increase of wearing surface neither increases nor diminishes the friction. Increase of diameter of journal diminishes the effective leverage, and under the same condition acts as a great retardant to motion, not because the friction is increased, but the retardation from friction occurs at a greater distance from the center of the axle, and under condition of greater velocity. This being the case, increase of length of journal is of more advantage than increase of diameter. All things being equal, increase of length can only be within the limits of strength of the metal forming the axle.

Mr. Millholland's experiment shows that a journal 8½ inches long is admissible, one 7 inches long, 3½ inches diameter, which is still more than twice its diameter in length of bearing, as clearly practicable, and your committee believe this proportion has been adopted by the Pennsylvania Central and a few other roads. The questions to be decided by careful experiment are, in the case of car axles:

1st. The greatest pressure per square inch that it is safe to carry with the ordinary method of lubrication.

2d. The limit of elongation of bearing in an ordinary journal to any given diameter, within limits of safety.

It is not a difficult matter to give the sizes of a theoretically well-proportioned journal for this purpose, adapted to any given condition of weight, character of the journal-bearing, and the nature of the lubricant, but your committee are not well enough satisfied as to the average of these conditions in practice, and deem it advisable to make further inquiries in this direction, yet feel satisfied that an increase of length over 5½ inches will be found to be in the direction of economy.

The replies to the sixth and seventh inquiries, regarding the dimensions of the most approved engine and engine-truck axles, are embodied in the following table:

To the seventh inquiry, asking where the fractures of such axles occur, in case of breakage, ten members have replied that they have had no breakages of such axles; an equal number report that the breakages occur almost invariably next to the hub of the wheel.

With reference to the subject of the eighth inquiry, "What is your rule for forcing on car and locomotive wheels; that is, how much larger is the axle than the hole in the wheel, and how much is the maximum pressure allowed in pressing them on?" the opinions of the members seemed to differ very widely. Some report that they make axles and wheels as nearly of one size as possible, while others allow a difference of as much as 1-64 for car and 1-32 for engine wheels; some turn the axles straight, while others make them taper; some make engine-axles straight and car-axles taper, and others reverse this practice. One member reports: "I have no particular rule for forcing on car-wheels. I find it don't work. Some makes of wheels are much tougher than others." With reference to the pressure employed there is a diversity of practice, and it varies all the way from 14 to 45 tons for car-wheels, and from 28 to 100 tons for engine-wheels. One member reports that he "fits them as tight as his old screw-press will put them on." It will thus be seen that the replies from members shed very little light on this very important subject. We are enabled to give

the practice that obtains with the firm of A. Whitney & Sons, and has proven satisfactory in their experience. It is believed that Mr. Asa Whitney was one of the first in this country who endeavored to introduce a practical system of uniform size and fit in car-wheels and their axles. His earliest practice—now quite generally recognized—was to bore the wheels with double-ended cutters, one cutter taking out the most of the metal to be removed—using a fine feed—but to finish by taking a very light cut and a rapid and coarse feed—say ½ inch to the revolution of the wheel, thus hurrying the cutter through with as little chance to wear as possible; thus to insure uniformity of size in eye. This firm makes the cutter soft in the center, and capable of being kept up to size by stretching with hammer and anvil. They use a screw-press for forcing on, to which afterward was adopted a hydraulic cylinder for the purpose of noting the pressure, and they now endeavor to insure a uniform pressure of about 30 tons. Their practice in turning the fit part of axle is to turn with a tool that leaves a decided feed mark in the axle. A finishing tool is run on to this surface to insure easy entering of the axle into the wheel, but the fit size .007 inch larger than hole is obtained, not in the lathe, but in a separate machine, by running over this surface a hollow reamer, in which the numerous cutting edges are from time to time adjusted to size. Their effect is to remove the responsibility of the fit from the skill of the workman, and to enable less skillful workmen to produce more and better work than if unaided by these labor-saving devices.

The question of relative size of axle and eye was carefully considered in England, and the published results of the experiments agree nearly with the practice as given above, and which your committee think is in reality the common practice of this country. Doubtless very hard wheels require less difference of size than soft wheels, but in an extended system of manufacturing some particular uniform rule must of necessity be adopted, and your committee are of opinion that for car axles and for driving axles, a difference of size of .007 of an inch for the one and .012 inch for the other are sufficient, and will in practice require 30 tons pressure to force on car wheels and one proportionate for driving wheels.

To the eighth and ninth inquiries regarding loose wheels and compound axles, nearly all the members who answered the committee circulars report that they have had no experience with loose wheels. Mr. W. H. Griggs, of the New York & Oswego Midland road, reports that he has used "Gardner's patent cast sleeve in center of axle," and that he placed two cars, one with a patent axle, the other a similar car with an ordinary truck on a 30-foot grade and a 5-degree curve, and started them each from the same point. The car with the patent axle ran 280 feet the farthest and also ran very smoothly around curves. Mr. Thomas Connell, of the Buffalo, Osgy & Pitts-burgh Railroad, reports that he "had some experience with each wheel of a truck on an independent axle, but it did not work well. There were several thousand dollars expended on it, after which it was thrown away. All amounted to nothing but expense while it was in use." Another member is of the opinion that "if one loose wheel were used it would result in a great saving in wear and tear." With this latter exception all who have made any reply to the eleventh inquiry are very decided in their condemnation of all loose wheels and compound axles.

Were it not that there is now and has been for many years a perennial crop of inventions of different forms of loose wheels and compound axles, the subject would, perhaps, not require any further consideration. But as much time, money, patience and ingenuity have been wasted in this direction, the committee have thought that a resolution expressing it as the opinion of this Association that the use of loose wheels would not result in any advantage might do some good in diverting the attention of over-sanguine inventors into more promising fields. They also suggest that the discussion of this part of the report be postponed until after Mr. Wells' paper be read, to which reference has already been made. One member of your committee engaged in an extensive series of carefully conducted experiments about 23 years ago, to demonstrate the value of tight wheels, but the experiments resulted in the same conclusions as were attained by Mr. Wells in his more recent experiments, in which, it will be noted, he found more advantage in the use of loose wheels at slow speed, but a disadvantage at the speed which obtains in ordinary traffic.

Your Committee are of opinion that it is very desirable that some uniform standard of axles be adopted by this Association which in time may come to be the standard of the land, but in view of other societies being at this time engaged on the same subject, and having interest in common, your committee beg leave to report progress only, and to ask the passage of the following resolutions:

1st. Resolved, That this committee be continued and that it be authorized to confer with the committee appointed by the Master Car Builders' Association for the same purpose, to report at the next meeting.

2d. Resolved, That in the opinion of this Association no practical advantage will result from the use of loose wheels or compound axles in ordinary railway service.

All of which is respectfully submitted.

M. N. FORNEY,
COLEMAN SELLERS,
GORDON H. NOTT.

Mr. I. W. VAN HOUTEN—I happen to know all about that thing. I have read it all through. I happen to know that the Master Mechanics asked to have our committee confer with theirs, and that was the ground upon which I made the motion, and stated that we did not ask to have that report come in here, because they are not ready to submit it. This thing is to be further considered by their committee, conferring, as they solicited, with the committee from this Association. I did not vote either way on the question of asking the Master Mechanics to present that report to this meeting, and therefore I move the reconsideration of the vote just taken to ask the Master Mechanics to bring their report here for our consideration and discussion. If that motion is carried, I have another motion to offer.

The CHAIR—As I understand it, this communication has been presented only as part of the discussion. It is for our information, the same as we would accept information from any one of our own members.

Mr. VAN HOUTEN—I would ask Mr. Forney if the Master Mechanics did not ask that this Association appoint a committee to confer with their committee on this subject?

Mr. FORNEY—There was a resolution at the end of this report, which I did not read, which covers that ground. It was resolved, first, that the committee be continued, and that it be authorized to confer with a committee appointed by the Master Car-Builders' Association for the same purpose, and report at the next meeting.

Mr. VAN HOUTEN—That is the point. That is all I want to know. They respectfully come to this convention, asking that we appoint a similar committee to consider this question of axles, which committee, after having considered the question, would submit something to both associations as the recommendation of the majority of those combined committees.

Mr. FORNEY—As I stated before, it occurred to the committee of the Master Mechanics' Association that if they made a report recommending a size entirely different from that recommended by the committee of this Association, it would, of course, create a great deal of confusion, and to avoid that we requested our Association to authorize us to confer with the committee of this body.

Mr. VAN HOUTEN—If this convention is prepared to discuss the matter of axles, and recommend by their votes a certain

* Published in the RAILROAD GAZETTE of June 7.

*Omitted.

size of axle, without showing a proper respect and regard for the master mechanics with reference to what they have asked us to do, I wish to say that you are at liberty to do it, but I am not in; because I have more respect for their judgment, and more regard for what common courtesy requires, than to do that.

The further consideration of the subject was then postponed until 10 o'clock Friday morning, and the committee authorized to confer with the committee of the Master Mechanics' Association.

At Friday morning's session the Chair announced that the hour had arrived for resuming the consideration of the subject of axles and journals, the question being on the motion of Mr. Adams to substitute a journal 4 inches in diameter, instead of 3½, as recommended by the committee. This motion was made as an amendment to the motion of Mr. Johnson, that the report of the committee be adopted. Pending the consideration of the amendment, yesterday, the committee was instructed to confer with the committee of the Master Mechanics' Association, and report this morning, whereupon—

Mr. F. D. Adams, the chairman of the committee, reported that they had, agreeably to their instructions, conferred with the committee of the Master Mechanics' Association, and that the joint committees had concluded that, if obliged to recommend a size of journal for car-axles, they would at present not feel authorized to propose one larger than 3½ inches in diameter and 7 inches long; but that, in consideration of the great importance of the subject, the diversity of opinion, and to some extent the limited knowledge existing in regard to it, the committee recommended that the subject be referred back, with instructions to confer with the committee of the Master Mechanics' Association, and report specific sizes for a standard axle, with a detailed drawing showing clearly its form and proportions, to the next annual meeting. The committee, however, recommended that the subject be fully discussed at this time.

Mr. L. W. VAN HOUTEN moved that the report be adopted. Mr. L. GAREY—I really hope that this matter will not be passed over for another year. It has been discussed now for two years. We have probably added one hundred thousand cars to our rolling stock during that time; and if you go on during another year and add another hundred thousand to it, I think possibly we may be a little better prepared to adopt something a year hence. But it does appear to me that, after having the subject before us in the manner in which we have had it for the past year, we should be prepared to do something. This procrastination, I think, is wrong. I believe in making haste slowly, but I do want to see this matter considered now, and I hope it may be settled.

Mr. R. B. MORE, Indianapolis & St. Louis—I hope this matter will not be passed over. I think we are fully prepared to adopt some definite course. The matter has been under discussion now for two years, and the sooner it is disposed of the better. I do sincerely hope that we may come to a final decision; and if we only accomplish that at this meeting, I think we will have done a very good work—one that will pay for all the expense and trouble we have incurred. I also hope we will adopt not less than a 4-inch journal and a 5-inch wheel-seat—which is small enough. There was considerable discussion yesterday, and a great many men who have had a long and successful experience with small journals gave their opinions. Now, it is very important that we have an axle that will not break. If a 4½-inch axle breaks occasionally inside the wheel, as we have known them to do, and if half an inch additional in diameter will prevent them from breaking, then it is certainly a very simple matter to be arranged. By adopting this course we shall certainly add so much to the strength of the axle. The increased size of the journal would also tend to reduce the large amount of hot boxes that we have now. Another thing to be taken into consideration is, that there is a disposition to increase the burdens carried on our roads. Frequently from 18 to 20 tons are placed on a car. And then we must have some little look ahead, and some regard to the exigencies of the future; for we know that the roads will carry heavier loads than they do now—the legitimate load being ten tons. We are adopting an axle now, not only for the time being, but one that we hope will stand for some years in the future, at least. Let us get it, if anything, a little too strong. It will be a great deal better to be that way than too weak. The additional expense caused by the increased size of the axle will be but small; and, as I understand it, the additional expense of putting it on the road will not be anything. We only propose, as I understand it, to put up our new work in this way, so that there will really be no expense to anybody by reason of the adoption of this recommendation. All we propose to recommend is the adoption of this standard size, and I really hope that we will now come right down to the business before us, and adopt some definite proposition.

The Chair ruled Mr. Van Houten's motion out of order. The question is now open for discussion on the amendment offered by Mr. Adams. The motion is to increase the size of the journal from 3½ inches to 4 inches.

Mr. E. VARNY, Pittsburgh Railroad—I for one hope that we shall not recommend increasing the size of the journal to 4 inches. There has been a good deal said in regard to the dead weight of cars, and the desire seems to be to get lighter stock on our roads. Now, if we increase the journals to 4 inches by 7, we have got to have all the other parts of the axle increased in proportion, which is going to add a good deal to the weight of it, and I think it would be very unnecessary. It is true that we have run axles that we consider too small. We have a good many 3-inch journals on our road now that are doing their work efficiently, and they carry ten or fifteen tons. They break occasionally, but not very often. I have not had one break for the past five years. We have got a larger size, which we have adopted, which is 3½ inches in diameter. I never have had one of those break. My wheel-seat is 4½. I have never had one of that size break inside the wheel. I have had 2½ tons of freight come down on journals and axles of that size. It brought this great weight safely. Now, I think that to increase the diameter to 4 inches is carrying the matter too far. I don't think our officers will sustain us in doing so. If we have got to have everything else in proportion, it is going to make a great deal of dead weight. We have got to have a heavy oil-box and a heavy jaw to receive it. Everything has got to be increased in size. I should not go above 3½x7 inches. That would be large enough for anything. We build cars for ten tons; if the officers allow twenty tons to be put on these cars it is their fault, and the axles ought to break once in a while so as to prevent overloading in this way.

Mr. H. LONGEST, Richmond, Danville & Piedmont—I would state, for the information of the Association, that I have cars on my road which have journals 6 inches long and 3½ inches in diameter. They will carry forty tons, and none of them have given way for the last six months. I would like to see a journal 7 inches long—I am in favor of that. In regard to the diameter of the journal, I would not go beyond 3½ inches. That would be amply sufficient for all the cars that we build. As to the length of the axles, of course, you can fix it that way. They have different gauges on our roads.

Mr. T. B. STEWART, Hartford & Wethersfield Street Railroad—There is one thing of importance for us to consider when we are making the change, and that is, whether the increase proposed will be sufficiently large, so that, if we wish, or if it should be positively necessary to return to 3½ inches, it can be done. If it is made 3½ inches, you can go beyond that, and afterward make it 4 inches. Our axles are growing larger and some of them will actually be 3½ inches in diameter, and the journal and wheel-seat accordingly. When I have occasion to make anything of that kind, I wish to be sure and be on the safe side, so that it will not be necessary to alter everything over again. We can come back to 3½ inches, if we determine it in the way I have

suggested. Therefore, it looks very clear to me that it will be advisable to adopt that course upon the showing of such tests as we have had. Now, there are various ways of testing this matter, which can be readily applied, as suggested, to different kinds and amounts of metal that we find rusted and worn out. That proves very conclusively something definite in regard to this question, and no one can bring any proof to counteract it. It looks very clear that anything which has stood such tests as this must be possessed of actual merit.

Mr. R. HITCHCOCK, Connecticut River Railroad—From Mr. Garey's statement yesterday, of experiments made by him, I infer that the conditions of these various experiments were equal. I would like to ask if that was not the case—that is, the weight of the car, the number of wheels in use, etc., etc. My purpose is, that this convention may know whether we are making provision for a car-wheel that is to support a car weighing thirty tons, or one that is to support twenty tons. I don't believe that a few years hence we shall build a car that will weigh thirty tons, for common use. It is commonly the case that one extreme follows another, and I would warn this convention against these extremes. It seems to me that the increase of the length of journals would be a benefit, but to go beyond 3½ inches I should certainly object to, for I think it entirely unnecessary; 3½ inches would be my choice. I have never noticed in my experience the breaking of journals unless the box had been neglected—hot boxes often literally burnt them out. We have frequently had them burnt off from the inside of the rail, but never from the outside. I hope gentlemen will consider the matter well before they fix the size, as some have suggested here. The remarks that have been made are very proper, but I do not see the necessity for so large a journal. I have run axles 80 miles, and then found that they supported a weight of 30 tons, the journal being 5½ inches, and the weight of the car 19 tons.

Mr. WILLIAM JOHNSON—Are you not mistaken in regard to the car being a freight-car, which you said weighed nineteen tons?

Mr. R. HITCHCOCK—It was a passenger-car. Mr. L. GAREY—I will endeavor to answer Mr. Johnson's question. It was a baggage-car belonging to a passenger-train; it weighed about nineteen tons. Each bearing had the same service to perform, having the same attention, the same lubricator, and everything as nearly equal as it was possible to have it. That was the intention.

Mr. R. HITCHCOCK—I wanted to know more particularly what the weight of this car was—whether a journal of the largest size was of as much benefit to a car weighing nineteen tons, as it might be, perhaps, to one of thirty tons—not understanding what the weight of the car was.

Mr. L. GAREY—I would like to correct my statement in reference to this journal. It was taken from a baggage-car, weighing fourteen tons, with the usual amount of baggage, and frequently running up to 22 and 23 tons. We had only passenger coaches on with the exception of the baggage-car from which this was taken.

Mr. F. D. ADAMS—In all the remarks that have been made thus far in relation to the axles, on the part of those who are opposed to an increase in the size of the journal, it seems to me that the speakers have lost sight of the main object, as I understand it. In other words, they are trying to show, entirely and altogether, that what they have got is doing pretty well. We do not deny that at all, in the main. But we, who are in favor of a larger axle, claim that we ought to do a great deal better; and we come here with practical facts that are proved beyond possible contradiction, and demonstrate that we can do better with larger journals. Now, it seems to me that, unless a person were governed very largely by prejudice, he must admit those facts, if he were inclined to admit the truth at any time. Now, there are none of us that would wish to charge Mr. Garey with any attempt at evasion in this matter. He has put different kinds of axles under a car, and then run them under the same circumstances exactly. He has demonstrated, beyond all dispute, that a journal which has a diameter of 3½ inches, and is 7 inches long, consumes half the amount of brass that one, running under the same circumstances and weight, that measures 5½ by 3½ inches consumes. Now, just figure that up, and consider it by itself. You can see, and anybody who will run it over in his mind can see, what a saving that single item would make to a railroad company in a year. A company that owned 4,000 cars—and many of our railroad companies have 20,000—would have 32,000 brass bearings, and by the saving of half the metal, a very nice sum of money would be saved to the company. They say you are going to add wonderfully to the expense of railroads. They say, "What are we going to do with our old cars?" I do not propose to add to the expense at all, except on the first item of the weight of the axles themselves. It is true that we should add a little to the expense there. But if it be a slight increase of expense, we insure, too, a greater degree of safety for our trains. It would be a great safeguard against the large expenditures that are occasioned on railroads in consequence of broken axles. It is no uncommon thing for a railroad company to pay fifteen or twenty thousand dollars in consequence of the breaking of an axle. That would go a great way toward strengthening up the wheel-seats, to say nothing of the saving we can make in the brasses. My own opinion is, that very many of our members are laboring under a great mistake in reference to this matter.

Mr. VAN HOUTEN—Can you name any particular accident that has occurred during the last year from the breaking of axles?

Mr. F. D. ADAMS—It would take considerable time to run over the many I can name. I have one in my mind now, which occurred on our road last year. It was an accident to a Michigan Central car, which caused an expense of \$20,000 to the company, and lost the lives of two men. I could state a very large number of such cases. But, to go back to what I was saying, I think there is in the minds of many of our members a prevailing opinion—evidence to the contrary notwithstanding—that just as quick as we increase the bearing surfaces we increase our friction.

The idea is certainly untenable, as any one will see who will examine the scientific record on the subject. There is no scientific writer in existence that I know of—and I have studied this thing up for the last year, and can produce, if necessary, some of the best authorities on the matter—that pretends to claim that surface has anything to do with friction. They say that it is weight entirely and exclusively that produces friction. If that is a fact positively established, and one which is recognized by all the scientific world, and by all the scientific men employed by our government, it strikes me that we master car-builders had better admit it to be a fact, and govern ourselves accordingly. I don't know but what we can make head against it, but I don't believe we can. I don't think that the determination on the part of some of our friends to bluff us off, or shake our determination, or bring up something to confuse us, is going to drive us from the point. I think that the members who are advocates of a larger axle—both the committee and all others—believe that it would reduce the expenses of our railroads in a few years. We don't claim that it is going to reduce it at first. I am willing, at any rate, to reduce the diameter of the journal down to 3½ inches. If that will meet the views of other members, I will cheerfully consent to it. I would be perfectly willing to withdraw the motion I have made, and put the matter in that form, if I thought that proposition would be accepted. I am perfectly willing to accept a 3½-inch journal, reducing the wheel-seat in the same proportion.

Mr. E. VARNY—I think the gentleman who last spoke seems to desire to give the impression that there are a good many members present who oppose an increase in the size of the axle. I do not see one who is opposed to an increase. The thing that is opposed is this enormous increase. I said before

that I should not be willing to accept anything larger than 3½ inches. That was saying that I would accept that for the sake of a compromise.

Mr. F. D. ADAMS—I am glad to hear Mr. Varney say that. I have heard no gentleman say that he was not in favor of an increase.

Mr. F. CHILDS, Great Western of Canada—Without expressing any opinion upon this question, I would like to give you a little of my experience. In the first place, I want you to understand that upon our road we do a very heavy square-timber business. We never could get cars enough to carry this timber. They are all flat cars. The question arose as to whether it would not be better to build cars that would carry more than ten tons. Mr. Sharp, who was Superintendent at that time, took it into his head to build some cars that would carry 50 tons, and we carry 50 tons on them. Each car has eight axles, or sixteen wheels. The journals are 7 by 3½ inches. I never knew one of them to break. I don't know that I never knew one of them to run hot. I wish you all to understand that I am decidedly in favor of the enlargement of the journals; but it would be a question in my mind whether it would be necessary to take it up to 4 inches. Of course, if other gentlemen think it would be necessary to do so, I would not vote against it.

Mr. H. O. WADLIE, Illinois Central—I wish to say that we are running 3½x6 journals, and probably meet with as good success in running that size as any road in the country. We lose very few axles. Mr. Van Houten yesterday asked a question which has not been answered, and which is of considerable importance in my mind with reference to ascertaining the proper size of the journal. He pointed to this model of an axle here, and asked how many axles we had seen broken off just at the inside shoulder of the journal bearing.

Mr. W. E. CHAMBERLAIN—I have seen twenty-five broken off inside of the inside shoulder of the journal within the last twelve months.

Mr. A. STEINBACH, Philadelphia & Reading—Four years ago, before we increased the diameter of our journals from 3½ inches on our road, we had seventeen journals broken off at that very point. That induced us to increase the size. Our journals are 3½x8.

Mr. WADLIE—How many of those axles broken off at that point had hot bearings?

Mr. STEINBACH—There was not one.

Mr. CHAMBERLAIN—I will not say positively that there were no hot axles. Three trains in one day broke down in front of our shop, and waited there for the journals to cool. They were trains of stock cars, going into Brighton. The journals were 3½x5½.

Mr. WADLIE—Can you tell us how long those axles had run, and whether or not they had at previous times been hot?

Mr. CHAMBERLAIN—I should think not, from the appearance of the journals. I could not state as to the length of time that the axles had been run. On some of them there was not much wear.

Mr. BRAY, Lake Shore & Michigan Southern—Were not the journals very much crystallized?

Mr. CHAMBERLAIN—I don't know much about crystallization, and therefore cannot inform you. The Boston & Albany road does not put anything on that goes down to three inches, or allow anything to stay on the road that is below three inches.

Mr. WADLIE—I am highly gratified with those answers. They are very much different from my own experience. I have received messages many times from trains on which it was reported that journals were broken. But in the course of twenty years I have seen but one journal that had a good, fair break in it at that point. Gentlemen talk about broken journals where there have been hot boxes worn half way off, brasses worn out, or a place worn by the bearings on the inside end of the oil-box. There are all sorts of wearings where they call it a broken journal. But I have met with but one case that I could say was a good, fair break. That was under a Cleveland, Buffalo & Erie car. My friend Adams had charge of the road at the time, and I put in a pair of wheels. I accounted for the break in this way: we had a gauge that was different from that of a connecting road. The car upon which the journal was broken off had been received from that road, and was of a wider gauge than that journal could possibly run on and keep inside the rail. The wheel dropped out after running some four miles on our road. My idea would be that a 3½ inch diameter is large enough. In regard to the length, I should favor an increase of that, rather than making it less than six inches.

Mr. M. P. FORD, Pittsburgh, Cincinnati & St. Louis—I am in favor of a journal 3½ inches by 7. One reason why I am opposed to a larger one is, that I believe by increasing the size of the journals we increase the amount of friction. I believe that what we want is, first, to get a size sufficiently large to insure safety, and then to distribute the weight over a larger surface. We should put the increase on the length of the journal rather than on the diameter. It must be evident to us all that an axle revolving with a 4-inch journal must travel some ways further on its surface than one revolving with a 3½-inch journal; consequently there is more space traveled over on the bearing; and it seems to me that we lose power, increase the friction, and save nothing in the matter of safety.

Mr. W. E. CHAMBERLAIN—I want larger axles for three reasons: First, we are troubled with axles breaking at three points—the inside collar of the axle and at the wheel-fit, both inside and outside. Seven years ago I was connected with the Atlantic & Great Western Railroad at a place in Ohio. At that time our passenger cars were equipped with 3½x7-inch journals, to conform with the cars of the Erie road. The calculation was to run our cars from Cincinnati to New York, and thence from New York to Cincinnati. Of these journals, we averaged about seven in a year broken off at the inside shoulder. At that time we went to work and narrowed up our trucks and put in a journal measuring 3½x6. We had no trouble from the breaking of journals of that size while I was on the road, though we had lots of hot boxes. I should recommend a little different style of axle on the back part of the wheel-seat from that represented in this large model before me. Every time a pair of wheels is worn out it is necessary to turn a little off from the wheel-fit. As we have axles already in use that break on the inside shoulder, we should naturally turn off and leave a little bit of a curve, even with one fitting; consequently we are weakening our axle to that extent.

Mr. M. N. FORNEY—I am satisfied from my investigations that friction will not be increased by increasing the surface of the axle. The amount of friction is dependent upon the condition of lubrication. A large axle can be lubricated more perfectly than a small one. The reason why axles break is because they are not strong enough. Therefore I am in favor of making them as strong as possible. I should recommend 4 inches by 8. In my opinion, it is more desirable to increase the length than to increase the diameter, and the friction will be less with an increased length than with an increased diameter. But on an axle you have a load to carry, and must furnish the requisite strength. There is a limit beyond which you cannot increase the length. You must, therefore, increase the diameter. I don't know whether you have observed the difference there is in the power of a shaft to turn, between one well lubricated and one imperfectly lubricated. One is ten times greater than the other. The greater the weight is, the more liable is the lubricant to be forced out. With a large surface there is comparatively little danger of the lubricant being forced out, and the whole journal is more perfectly lubricated than if the weight were concentrated on a smaller surface. I don't think you will get strength enough for our heaviest cars without making the journals 4 inches by 8. It is true that my investigations have been more of a theoretical than of a prac-

tical nature; but there can be no question in the mind of any one who will investigate the subject, that friction is not increased by increasing the surface. That has been decided over and over again by experiments made a hundred years ago, and very often in more recent times. The result has been uniformly the same. The friction is directly proportioned to the weight upon the journal.

Mr. J. T. LEIGHTON, New Haven Car Co.—I don't know much about the wearing out of cars, except what I gather from such a discussion as this. However, I can readily see that the journals should be enlarged. I think it is important, also, that the wheel-fits should be enlarged. As I understand it, there are more breakages on the inside of the wheel-fit than on the outside; consequently, you should have more iron on the inside. In order to get that you have got to incur some additional expense. But after you have once incurred that expense it seems to be useless to throw your iron away on the other end. I think it has been demonstrated here that the friction is not increased by an increase of surface. From all the information I can gather, I am led to favor the enlargement of the journal to 3½ inches by 7 inches.

Mr. A. C. ROBSON, Lake Shore & Michigan Southern—The standard axle of the Lake Shore road, at the present time, is 3½x6½. We do not allow those axles to run over one year. I have never yet known one of them to break. I have at Buffalo, at the present time, about 300 of them that have been taken out, having done their service. I think if that size axle was adopted, and they were not allowed to run after the iron began to crystallize, we would have no difficulty with broken axles.

Mr. L. H. CUMMINGS, Cummings Car Works—I believe that most of the narrow-gauge roads are using, at present, 3½ by 6 journals on a majority of their cars. If you increase the length of the journal to 7 inches, I think the diameter should be increased to 3½ inches.

Mr. J. W. PHILBRICK, Maine Central—I have trusted my cars for a long time, as have a great many of us, upon 3½ by 5½ journals, with a very small percentage of breakage and a small share of hot boxes. I propose to prevent hot boxes by adding ¼ inch to the length of the journal, and to give extra strength, in proportion to that leverage, by adding 16 per cent. to the quantity of iron. This would probably increase the strength twenty per cent. or more.

Mr. J. P. SOMERBY, Eastern Railroad, moved that the roll be called, and that each member state the dimensions of journal he preferred. The motion was carried, the roll was called, and each member announced his preference, the result being as follows:

In favor of a 3½x7 journal—Messrs. Ruel Dean, I. W. Van Houten, David H. Baker, Hugh Gray, G. W. Demarest, Christopher Woods, A. Langley, James McGee, Robert Hitchcock, George Dunham, M. P. Ford, A. Gleason, J. T. Nalls, Samuel Campbell, W. R. Davenport, A. C. Robson, F. O. Bray, Jacob Hay, Albert H. Dennett, William J. Worth, J. D. Mollwain, J. J. Traver, J. W. Philbrick, D. H. Stratton and A. J. Allen—25.

In favor of 3½x7—Messrs. Joseph Jones, V. D. Perry, George R. Bentley, F. D. Adams, D. S. Dockstader, George Hackett, M. C. Andrews, H. Longest, George E. Stevens, Leander Garey, Milton Wilder, L. H. Cummings, J. Marsh, J. B. Weston, J. P. Somerby, D. C. Richardson, B. F. Mitchell, James T. Leighton—18.

In favor of 4x7—Messrs. C. A. Smith, W. E. Chamberlain, Samuel Griffith, R. B. Moore, W. H. H. Price, Thomas G. Davis and C. E. Garey—7.

In favor of 3½x6½—Messrs. Enos Varney, W. A. Morgan and S. A. Davis—3.

In favor of 4x8, M. N. Forney; 4x6½, C. J. Holbach; 3½x8, Aaron Steinbach; 3½x7, John Lightner; 3½x7, H. O. Wadlie; 3½x6, J. N. King.

[TO BE CONTINUED.]

OLD AND NEW ROADS.

Baltimore & Ohio.

This company seems to have gone into the "summer resort" business, for we find its General Manager of Hotels (Mr. H. M. Kinsley, formerly of Chicago, and a famous caterer) advertising the company's "Deer Park Hotel," in Garrett County, Md., as "a delightful summer retreat in the Allegheny Mountains, 2,800 feet above tide-water," all to be open July 1, with "bowling alleys, billiard rooms, croquet and quail grounds, boarding and livery stables, baths—hot, cold and shower," and also a "first-class orchestra." Another advantage advertised is "round trip tickets, good till October 31, at reduced rates."

North Louisiana & Texas.

The New Orleans *Picayune*, of June 14, says: "We understand that the negotiation between this and the Texas & Pacific companies has resulted in an agreement by which the Texas & Pacific Company, becomes the owner of all the stock of the North Louisiana & Texas Railway Company except that owned by the State of Louisiana, and that the contract of sale will be signed at Monroe in a few days from this time."

"It is stated that one of the conditions of this contract is that the suit now pending on appeal before the Supreme Court of the United States, entitled *Henry R. Jackson et al. vs. the Vicksburg, Shreveport & Texas Railroad Company*, John T. Ludeling et al., shall be discontinued, the plaintiffs therein, who are bondholders of the Vicksburg, Shreveport & Texas Railroad Company, receiving in full settlement of their claims fifty cents on the dollar on the face of their bonds, payable in new bonds of the North Louisiana & Texas Railroad Company, secured by first mortgage on the line."

"We are informed, however, that a suit was filed on the chancery side of the United States Court here, this week, at the instance of the old bondholders of the Vicksburg, Shreveport & Texas who were not parties to the Jackson suit, for the purpose of having Ludeling & Co.'s title declared invalid. The charges and averments of the bill are similar to those made in the Jackson suit, with additions. The plaintiff in this new suit refuses to accept the compromise to which Jackson and his co-suitors have assented, being determined that the Supreme Court of the United States shall pass upon the sale of the Vicksburg, Shreveport & Texas Railroad made to Ludeling and others in 1866."

The North Louisiana & Texas (formerly the Vicksburg, Shreveport & Texas) road is to extend from the Mississippi River opposite Vicksburg to Shreveport, La., a distance of 170 miles. The road is completed and in operation from the Mississippi west to Monroe, La., 72 miles.

Pacific, of Missouri.

The application for an injunction to restrain the Governor of Missouri from advertising the road for sale to satisfy the State lien came up before Judge Dillon, in the United States Circuit Court at Davenport, Ia., June 14. After hearing some arguments, the court took the matter under advisement until July 23. The counsel for the Governor of Missouri having agreed that the notice of sale should not be published before that date, no preliminary injunction was issued.

Atlantic & Pacific.

Considerable excitement has been caused among the merchants of St. Louis by new arrangements for delivering freight made by this company. The company recently let a contract for the delivery of freight and collection of charges in St. Louis to Mr. C. H. Merry, and he, contrary to the previous custom, requires payment of all charges before goods can be unloaded, and also requires, in the case of consignments of mixed freight, that the whole consignment shall be paid and receipted for at

once. He also declines to notify consignees of the arrival of their goods.

Pioche & Bullionville.

This narrow-gauge road was completed and the first train passed over it June 10. The road, which has no connection with any other line, extends from Pioche in southeastern Nevada to Bullionville, a distance of 18 miles. It was constructed chiefly for the purpose of hauling ore from the mines to the mills.

Bangor & Calais Shore Line.

The stockholders have accepted the amendment to the charter which allows the company to make Bucksport, instead of Bangor, the western terminus of the road.

New Jersey Railway.

It is stated that this company has secured control of the Philadelphia & Newtown Railroad, now under construction, and that that road will be used as the Philadelphia end of the line. The Philadelphia & Newtown road has a Pennsylvania charter, under which it has authority to bridge the Delaware near Yardleyville. It is said that the surveys of the New Jersey Railway are nearly completed from Waverly (near Newark) to the Delaware near Yardleyville, and that contracts will shortly be let.

This is the company which proposes to build a new line from New York to Philadelphia in the interest of the Pennsylvania Railroad Company.

National.

It is reported that proceedings in bankruptcy have been commenced against this company in Philadelphia. So far as can be ascertained, no work is now being done on the road, although no legal obstacle to its completion now exists.

The time set by the company for the payment for land taken for the road through Mercer and Somerset counties, N. J., has passed, but no payments have been made.

Camden, Gloucester & Mount Ephraim.

This company, which recently filed its articles of incorporation with the Secretary of State of New Jersey, intends to build a railroad from Camden, N. J., southeast through Gloucester City to Mount Ephraim, a distance of about six miles. The capital stock is to be \$50,000.

Berks County.

The grading of the first half of the road (20 miles) from Reading, Pa., northeast is nearly completed, with the exception of three cuts, two of which are quite short, in slate, while the third is through limestone and is 400 feet long and 22 feet deep at the deepest part. Track-laying will be commenced as soon as the long cut is completed.

New York & Long Branch.

Ground was broken for this road (the lower end of the New Jersey Central's Long Branch line) at South Amboy, N. J., June 10.

Cuyahoga Valley.

The route of this road has been finally located for the whole distance. The line follows the Cuyahoga River southward from Cleveland to Akron, 34 miles, and thence runs a little east of south 22 miles further to Canton, on the Pittsburgh, Fort Wayne & Chicago. From the summit, nine miles north of Canton, to Cleveland there is a continuous down grade, varying from three to 40 feet to the mile, the grades being thus all in favor of the heavy traffic, which is expected to be mainly in coal carried to Cleveland.

The contractors, Van Sickle & Conger, of Akron, have over 850 men at work, and the line between Canton and Akron is more than half graded. It is hoped that the grading will be completed by September and that tracklaying can be commenced by September 1. Only two bridges of any size will be required, both of which have been contracted for. Near Akron there will be a trestle work 1,000 feet long varying from 17 to 48 feet in height.

Washington City, Virginia Midland & Great Southern.

The Alexandria (Va.) *Gazette* says: "Work has already been commenced on the railroad to connect this road with the Baltimore & Ohio by a ferry across the Potomac at this city, and will, it is expected, as the route has been located, be completed during the next five months. A wharf will be built from the Maryland shore, opposite the foot of Wilkes street, extending from the river bank to the channel, and ferry-boats capable of carrying a whole train of cars will run between it and the railroad company's lot, at the mouth of the tunnel in this city."

The connection is now made by steamboat from Alexandria to Washington and by stage from the steamboat wharf in Washington to the Baltimore & Ohio depot. The latter company ceased, some time since, to run its cars over the Washington & Alexandria road.

Chicago & Paducah.

A large force is now at work laying track between Monticello, Ill., and Fairbury.

Indianapolis, Bloomington & Western.

A force is at work on the bridge over the Sangamon, between Monticello and Decatur, on the Decatur Branch. Track-laying will be commenced as soon as the bridge is finished.

Terre Haute & Southwestern.

In the suit of James Lankey against this company, the Supreme Court of Indiana recently decided that a railroad company has no interest in or right to a tax voted under the act of 1869 to aid in the construction of its road until it is collected and the subscription for the stock actually made, and cannot maintain an action for a mandate against a county treasurer to compel him to collect the tax voted for that purpose.

Chicago, Rock Island & Pacific.

This company has purchased a large tract of land near the new passenger house in Rock Island, Ill., and will build a new round house and extensive shops there.

Keokuk & Kansas City.

Negotiations are in progress for the transfer to this company of the road-bed which was partially graded through Saline County, Mo., some time ago by the Louisiana & Missouri River Railroad Company. Work on this road was given up when the subscription of Saline County was lost by a decision of the Supreme Court.

Junction City & Fort Kearney.

Work will shortly be commenced on the extension of this road northwestward from its present terminus at Clay Center, Kan. The road must be completed to the west line of Clay County by September 1, or forfeit the subscription of \$75,000 made by the county.

Lehigh & Eastern.

The party making the preliminary surveys has reached Port Jervis, N. Y. The route surveyed was from Hazleton, Pa., eastward to Stroudsburg, and thence northeast up the Delaware Valley to Port Jervis. The surveys are to be continued eastward to Newburg.

Ware River.

Under the act recently passed by the Massachusetts Legislature, a new company, with the same name, was recently organized in Ware, Mass. The road was recently sold under foreclosure, and by the act the bondholders were allowed to take either cash or stock in the new company for their bonds.

The holders of about \$100,000 took cash and those of the balance (\$650,000) took stock. The town of Ware voted to take stock for its bonds, and Templeton voted to take cash. The road now extends from Palmer, Mass. (the crossing of the Boston & Albany and the New London Northern), northeast to Gilbertville, 16 miles, and some work has been done on an extension to Winchendon, 33 miles further. The stockholders of the new company voted to authorize a new mortgage to provide money for completing the road to Winchendon, where it will connect with the Cheshire road.

Missouri, Kansas & Texas.

Trains commenced running regularly over the new extension from Sedalia, Mo., to Moberly, June 16.

European & North American.

Preparations are being made for the change of gauge from 5 feet 6 inches to 4 feet 8½ inches.

Lewiston & Androscoggin.

The application for an injunction to restrain the city of Lewiston, Me., from issuing its bonds to this company has been denied.

St. Joseph (Mo.) Union Stockyards.

A company with a capital of \$50,000 has been organized to build stockyards at St. Joseph, Mo. Ground has already been purchased in West St. Joseph, and work will be commenced at once. Among the principal stockholders are Messrs. J. M. Walker, of the Chicago, Burlington & Quincy; A. W. Lamb, of the Hannibal & St. Joseph, and Craig, of the Kansas City, St. Joseph & Council Bluffs.

A dispatch from St. Joseph says: "A contract has been made with the Atchison, Topeka & Santa Fe road to run all their stock cars in here, and that road alone expects to bring about 200,000 head of cattle. The Leavenworth, Lawrence & Galveston Railroad and the Atchison & Nebraska road are also making arrangements to come in here in a few weeks. The Burlington & Missouri River road has already concluded a contract with the St. Joseph & Council Bluffs Railroad to run over their track into this city."

St. Louis, Salem & Little Rock.

The last rail on this road was laid June 21. The road extends from Cuba, Mo., on the Atlantic & Pacific road 91 miles southwest from St. Louis, southward by a somewhat circuitous route to Salem. The length of the completed road is 45½ miles, and its cost, including equipments, is reported to be nearly \$2,000,000. The road reaches very extensive deposits of iron ore.

It is proposed to extend it southward to Eminence, 35 miles beyond Salem.

St. James & Little Rock.

This newly organized company proposes to build a railroad from Salem, Mo., the terminus of the St. Louis, Salem & Little Rock road, southward to Little Rock, Ark.

Mount Washington.

This railroad has just been opened in preparation for the summer travel. In clearing the road the working parties were obliged to shovel through a snowdrift eight feet deep and fifty rods in length. The road runs from the foot of Mount Washington (one of the White Mountains in New Hampshire) to the summit, and is used mainly for pleasure travel.

Central Pacific.

The *Sacramento Record* of June 16 says: "On the 13th a number of railroad men, bridge builders and laborers were at work on the bridge spanning the Feather River and connecting Marysville with Yuba City. Many of the piles supporting the eastern end have rotted away, and must be replaced before the bridge can be considered safe for the passage of trains of heavily laden cars. The road bed will be put in operating order as far west as Sutter station, 11 miles west of Marysville."

The road here referred to is the Marysville Branch, which extended from Davis, 6 miles west of Sacramento, on the California Pacific, northeast to Marysville, on the California & Oregon. Some bridges on the line were destroyed by freshets some time since, and the road is now only operated from Davis to Knight's Landing, on the Sacramento River, a distance of 19 miles. The restoration of the line from Marysville west to Sutter will still leave a gap of 13 miles between Knight's Landing and Sutter.

Work on the tunnel near Martinez for the loop line from Banta's to Oakland is being pushed forward.

Railroad Legislation in New York.

Among the acts recently passed by the New York Legislature and signed by the Governor are the following:

Act to dissolve the Cayuga Midland Railroad Company.

Act to enable the Staten Island Railway Company to have, use and run ferry boats.

Act to establish communication between Richmond County and New Jersey, incorporating the Tubular Transit Company of Staten Island.

Act to provide for the extension of the New York, Kingston & Syracuse Railroad.

Act authorizing the Adirondack Company to build a branch railroad to the village of Caldwell.

Act authorizing the construction of a railroad from the city of Syracuse to the new freight yard of the New York Central & Hudson River Railroad in the town of De Witt, in the County of Onondaga.

Act to enable the Syracuse & Chenango Railroad Company to purchase the property and franchises of the Syracuse & Chenango Valley Railroad Company.

Act authorizing the Geneva & Ithaca Railroad Company to extend their road.

New Issues of Bonds in the Market.

The Chicago & Canada Southern offers, through Leonard, Sheldon & Foster and Winslow, Lanier & Co., of New York, \$5,000,000 of 7 per cent. gold bonds, coupon and registered.

The New York Central & Hudson River asks bids until noon of July 2, for \$2,000,000 first mortgage 7 per cent. bonds, having 30 years to run.

The New Jersey Midland asks bids until noon of July 8 for \$600,000 consolidated mortgage 7 per cent. gold bonds, having 50 years to run.

The Toledo, Wabash & Western offers, through Winslow, Lanier & Co., and Perkins, Livingston & Post, of New York, \$1,000,000 of a new issue of \$5,000,000 of 7 per cent. gold bonds having 20 years to run.

The Jacksonville, Northwestern & Southeastern Railway Company, of Illinois, offers through Gibson, Casanova & Co., New York, \$2,500,000 of first mortgage 7 per cent. gold bonds at 90, the issue being at the rate of \$20,000 per mile.

The Burlington, Cedar Rapids & Minnesota offers the balance of an issue of first mortgage 7 per cent. gold bonds at the rate of \$20,000 a mile on the Milwaukee Division.

The Central Railroad and Banking Company, the Macon & Western Railroad Company and the Southwestern Railroad Company of Georgia (all of which have long paid dividends of from 8 to 10 per cent. yearly) ask proposals for \$2,000,000 of joint first mortgage 7 per cent. bonds, having 20 years to run, being part of an authorized issue of \$5,000,000, which would be at the rate of about \$7,000 per mile. Proposals will be received at the National City Bank of New York until July 16.

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Editorial Announcements.

Removals.—The Chicago office of the RAILROAD GAZETTE has been removed to No. 71 Jackson street, opposite Third avenue.

The New York office of the RAILROAD GAZETTE is removed to Room 131, No. 73 Broadway, opposite the upper elevator landing.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

WORKING LOCOMOTIVES BY CONTRACT.

Everybody recognizes the fact that wastefulness impoverishes individuals, but it is somewhat remarkable that so few see that it has the same effect upon communities. Any person with ordinary intelligence can see that if he expends a thousand dollars for fireworks he will be so much poorer after they are burned up; but it is hard to convince "the people" that a nation which expends millions for the more expensive fireworks of war is impoverished in the same way. This principle is of course applicable to the operation of railroads. Carelessness, inefficiency and ignorance in operations result in waste, which is the destruction of so much wealth. It is not merely the transfer of the title to wealth from one party to another, but usually it is the extinction of the results of a definite amount of human labor. Nowhere is this more obvious than in the management of locomotives. If an unskillful or careless fireman uses more fuel than is necessary, it is an absolute destruction of so much "value," from which no one is the gainer, and the wealth of the community is therefore diminished by just that amount.

Now we believe that we are quite within the limits of what is possible, if we assume that a careful and skillful locomotive runner and fireman will consume from ten to thirty per cent. less fuel, oil and waste than is ordinarily required for doing any given amount of work. If, then, any motive could be presented to induce men to exercise all the skill and care possible, and also to study the best means of reducing fuel consumption, it would have the effect of saving to the community a very considerable amount of wealth which is now wasted. In doing so they would also be cultivating habits of frugality, careful observation, and close study of cause and effect, thus making them not only better acquainted with their occupations, but making them better citizens every way, as the restraint which the acquisition of these habits implies has a moral influence on character at the same time, that it cultivates mere manual skill. To suppose that the average locomotive runner will exert himself to the utmost in order to save fuel because, in what appears to him an abstract sort of way, the community is impoverished by a waste of it, would be placing too high an estimate on his disinterestedness. Men of that class usually have too much of human nature in their constitutions to be so self-sacrificing. If, however, they could be made sharers

in the results of their economy, it would give an immediate and powerful stimulus to be careful and to learn all that will aid in reducing expenses.

Various attempts have been made in this direction, chiefly by offering premiums for the best results or by giving men a share of all saving below a certain amount. In many cases these have been said to be very effective, but they are apt to fall into disuse on account of the labor and attention required in directing and supervising their award, as the system of giving them is obviously capable of very great abuse and susceptible of being corrupted. The manager of a Western road has recently informed us that on the line under his management he reduced the fuel consumption very largely by offering premiums, first for keeping engines in the best condition, second for the lowest fuel consumption, third for the smallest number of cattle killed and fourth for the lowest cost of repairs per mile run. The reduction in all these items which resulted from this system was very great. The engines with which his road was equipped were all or nearly all new, and of similar design, and the traffic comparatively light, so that it was not very difficult to establish some equitable system of awarding the premiums. On a road with a great variety of engines and a heavy traffic of different kinds, which is constantly changing and which often must be done at great disadvantage, the problem is not so simple. But, even under the conditions first named, it is obvious that it would be necessary to watch the whole system with the utmost care, that it must be controlled with unsuspected honesty, and administered not only with an intention of, but with the mental and moral capacity for, dealing justly. These qualifications, it is hardly necessary to say, are not so common as it is desirable that they should be. The example referred to, and others which might be named, indicate, however, the effect which an appeal to the personal interests of those who operate locomotives has on the cost. It is, we think, absolutely certain that if the men could be interested more directly than they are when premiums alone are offered, a still greater difference in economy of operation would follow. What we want to propose is, that if locomotives were operated by a contract with the runner and the fireman to do so much work for a specified cost, say per mile run per car, or other equitable system of compensation, thus giving them the privilege of making out of such a contract whatever profit their skill and care would allow, it would inevitably be profitable to both parties—that is, to railroad companies and their employees. The plan which we contemplate would be to fix upon some fair system and rate of compensation for different kinds of traffic, and in different localities and with different engines, which of itself is no easy matter, and one which would require great care. In the next place, the locomotive runner should be allowed to select and dismiss his own fireman, subject to the approval of his superior officer, and be charged with the cost of all the fuel, oil and waste used on his engine, and credited with all the work done, at the rate determined on. The difference between the two would represent the profit or loss of the locomotive runner and his fireman, if they were in copartnership.

There are of course a great many difficulties and objections to the plan which may be urged against it. Many of these we would of course be obliged to admit, but thus far none of them have seemed insurmountable. It is said, for example, that if runners were interested in saving fuel and oil, they would steal them from each other and from cars, or whenever opportunity offered. This objection we believe to be futile, and quite under the control of the discipline and authority of the management. Another difficulty which presents itself occurs on roads which are not supplied with a sufficient amount of rolling stock, and on which the same engine is operated by different men. In such cases there might be some confusion, but even then it would be quite possible for the men who contract to run the engines to select others to take their places and do duty for them.

There would also be a constant temptation to lose time in one case and run fast in others, as it requires considerably less fuel to draw a train up grade at a slow than at a high speed, and in running down all the momentum which could be acquired would be so much clear gain in going up the next incline. There would also be considerable difference in trains, and in their running time, fuel would vary in quality, thus leading to frequent disputes, which it would be necessary to arrange equitably.

On most roads, too,—the older ones especially—there is very great difference in the efficiency of engines. Some would do any given amount of work much more economically than others, so that those who run them could contract to do any given service for considerably less with the best engines than they could with those which are less efficient. This difficulty could be provided for by adjusting the rates of compensation to the different classes of engines, or possibly by making the

different locomotives subject to open bids for doing a given service. That is, at a certain time, say once a year, all the engines would be presented for competitive tenders for operating them during the succeeding year. The best of them would thus be taken at the lowest rates, say per car per mile, and the price of the others would rise in inverse proportion to their efficiency, the poorest requiring the highest rate. If this system could be carried out, it would indicate with very great certainty which engines work most economically.

Another good result which would be accomplished by such a system is that it would, to some extent at least, supplant the leveling tendency of trades-unionism. The great curse of these organizations is that the skillful and industrious are brought to the same level as the ignorant and the idle. They try to enforce a common scale of wages for all. It is difficult, in fact, for them to enforce their demands in any other way. If, now, the best men should find that by exercising their skill and employing the most efficient assistants they could realize considerably more profit than is claimed by the union to which they have given allegiance, self-interest would soon induce them to oppose the policy which places them on the same level with those who, without the union to support them, would soon fall behind. A locomotive runner would thus, in fact, become an employer, and have all the interests of a person conducting his own business.

The economy which would result to the company, and the corresponding profit which the locomotive runners would realize, would also attract a superior class of men, which would in turn make still greater economy possible. Doubtless the fact that the compensation of locomotive runners was materially increased would soon lead the old money-bags style of men to suspect that somebody was being cheated, as that class of people can seldom see any one receiving an advantage without suspecting that some one else is being injured. It must be remembered, however, that at present, while thousands of dollars are wasted through the smoke-stacks of locomotives, no one seems to suspect that railroad companies are the losers of all that wealth. It is only when part of that waste is diverted into the pockets of those whose skill and care we are trying to enlist in saving it that it begins to be suspected that the companies are the losers.

In suggesting this system, we are of course impressed quite as much or more with the difficulties in the way of its adoption as we are with the advantages which it offers. It would require to be organized very cautiously and with great care and forethought, and watched and modified as experience would indicate the necessity. Our object has not been to propose any well-matured or carefully-defined method of doing it, but simply to suggest it, and if possible to call out discussion regarding its merits and practicability.

The trials of agricultural engines which of late years have been so frequent in England have shown conclusively what can be done with care and skill. They have developed what might be called almost a new art—that of firing. In the reports which are given of these trials the skill of the firemen is now discussed almost as much as the design of the engines, and seems to have quite as much to do with the results obtained. That a very much greater field is open to firemen of locomotive engines is quite clear, and that an equal amount of skill will be developed in firing them if the proper incentive is offered is, we believe, equally certain.

DUTIES TO THE PUBLIC.

One good result, doubtless, of the present excitement in the West concerning railroad management will be its tendency to make railroad managers consider more carefully than heretofore their duties towards the public which their roads serve. This was needed; for the tendency of all business which is so situated as to be to some degree independent of competition, and of corporation business particularly perhaps, is to consider almost solely the interests of those conducting the business, often to the neglect of the customers for whom the business is done, and for whose service, indeed, railroads are created. The fact that travelers and shippers have rights, and that their rights are equal, is doubtless acknowledged by all; and all conscientious managers have endeavored to recognize these rights in their conduct of railroad business. But a general disposition to be upright and impartial is not enough to secure justice in this case. To decide what is just and fair in the business of transportation often requires a laborious examination of evidence and a profound study of principles, something like what is required of a judge in the trial of a case at law; and while the judge has the evidence carefully collected and examined for him, and the principles on which a decision should be made presented to him with all the skill and clearness possessed by able minds with years of training, the railroad manager must usually search out, collect and study the evidence for himself,

and to a great extent ascertain the very principles on which his decision must be based by a study of the facts in his own experience, well established and generally recognized principles in railroad transportation hardly being known.

Having thus to make the laws and collect the evidence by which he is to administer justice it is not at all wonderful that the ablest, most experienced and most upright should sometimes do injustice. In fixing rates and regulations it is often so extremely difficult to learn exactly what would be just that an experienced manager rarely feels sure that he has decided correctly, and often gives judgment as an attempt at justice, perhaps wide of the mark, but the best that can be done where the evidence is very imperfect, the law uncertain, and where yet action must be had.

We do not mention these difficulties for the sake of excusing mistakes in management and unfairness in treating patrons, but to show how great reason there is for a patient and careful study for the sake of doing justice alike to shareholders and shippers. Doubtless it is often that the former suffer from bad judgment, and often when one suffers the other does also. If the rate is so low or the accommodations such that the service costs more than is paid for it, the stockholder and all the other customers have alike reason to complain; and when the rate is unreasonably high, sometimes business is driven away to an extent to more than balance the receipts from the higher rate. And the subject includes much more than a just arrangement of charges. The disposition of a management to recognize the rights of its patrons is perhaps more obvious in the efforts which it makes to serve them carefully and promptly, to give the best facilities for transacting business, and to deal patiently and courteously with all. A railroad company once made a very undesirable reputation by almost uniformly refusing to satisfy claims for losses and damages to goods carried by it. Aside from the positive loss arising from such a reputation, it ought to be a matter of conscience with the officers of railroad companies to right all such wrongs as early as possible after they have been once clearly proved. A reputable merchant who had delivered the wrong goods, or presented an excessive bill, or wronged a customer through the acts or even the manners of an employee, would not rest until he had satisfied or made an honest effort to satisfy the person wronged, and that not simply because he feared the loss of custom, but because his idea of the honorable conduct of business compelled him to such conduct. *Noblesse oblige* among honorable shopkeepers and honorable railroad men, no less than among men of blood and breeding. Railroad companies should endeavor to maintain a high ideal of the faithful service owed by them, and refuse to be satisfied with good earnings unless they have done good work in return. It is exceptionally important that they should do this, because not infrequently they alone are able to judge of the justice of their charges, the reasonableness of their rules, or the thoroughness with which they have done their work; and when they fail, though those who suffer may not be able to point out the causes of the failure, they are likely to make a loud outcry, and as far as possible visit the railroads with a punishment which is none the less severe to them because it in no way mends the matter and injures the customers of railroads more than it does their owners.

And in connection with a closer attention to their duties to the community, we believe that managers of railroads should make patient efforts to render intelligible the reasons for actions which may appear arbitrary and unjust. It may appear to be too great a task to dispel the dense ignorance prevailing concerning the somewhat complicated and difficult subject of transportation; but it is not at all improbable that the companies will at some time suffer largely from this ignorance, which is the real source of nearly all the unjust legislation proposed or enacted. And in a matter so closely involving the interests of every man in the community as railroad transportation, the public has a right to be well informed. More care in this direction and a more conscientious effort to serve the community faithfully will do much to cultivate a better understanding, and to relieve the companies of the burden of much undeserved blame, and from ill-considered and harmful efforts to deprive them of the control of their business.

Horace F. Clark.

Mr. Horace F. Clark, who died at his residence, No. 10 East Twenty-second street, New York, on the night of June 19, was the son of Rev. Daniel A. Clark, in his day one of the prominent ministers of the Presbyterian church, and was born at Southbury, Conn., November 29, 1815, and so was nearly 58 at the time of his death. He was prepared for college at Amherst, Mass., and received his degree as Bachelor of Arts from Williams College in 1833. The same year he began the study of

RAILROAD EARNINGS FOR MAY, 1873.

NAME OF ROAD.	Mileage.		Increase.		Earnings.		Inc.	Dec.	Per cent.	Earnings per mile.	
	1873.	1872.	Miles.	P. c.	1873.	1872.				1873.	1872.
Atlantic & Great Western.....	539	506	33	6%	\$428,521	\$425,534		\$7,010	1%	\$795	\$861
Atlantic & Pacific.....	328	328			112,275	87,759	\$24,516		28%	339	266
Burlington, Cedar Rapids & Minnesota.....	334	361	27	8%	82,682	65,638	16,050		24%	245	182
Central Pacific.....	1,218	1,094	124	11%	1,324,378	1,280,922		24,456	1%	1,114	1,062
Chicago & Alton.....	649	623	26	4%	426,816	409,254			4%	657	657
Chicago & Northwestern.....	1,404	1,353	51	3%	1,337,083	1,074,779	262,304		15%	881	794
Cleveland, Columbus, Cin. & Indianapolis.....	470	390	80	20%	394,485	373,619	20,866		5%	839	958
Erie.....	971	964	7	1%	1,754,841	1,767,986		13,165	0%	1,807	1,834
Illinois Central.....	1,109	1,109			687,630	648,955	38,675		5%	620	585
Indianapolis, Bloomington & Western.....	344	312	32	61%	133,758	125,886	7,872		6%	389	591
Kansas Pacific.....	672	672			533,763	341,643		9,080	2%	455	609
Lake Shore & Michigan Southern.....	1,136	1,032	104	10%	1,680,969	1,479,945	201,024		13%	1,480	1,284
Marquette & Cincinnati.....	284	284			125,683	153,717	28,034		17%	434	559
Milwaukee & St. Paul.....	1,396	1,121	275	24%	805,799	580,432	225,367		38%	632	518
Michigan Central.....	715	715			679,343	600,642	78,701		13%	950	849
Missouri, Kansas & Texas.....	641	516	125	24%	251,855	150,574	100,281		66%	392	292
Ohio & Mississippi.....	393	393			310,785	283,371	27,414		9%	791	721
Pacific of Missouri.....	471	471			301,521	269,559	31,962		11%	640	572
St. Louis, Alton & Terre Haute, N. W. Div.....	266	266			118,422	109,442	8,980		8%	445	411
St. Louis & Iron Mountain.....	71	71			51,796	32,049	19,747		61%	730	450
St. Louis, Kansas City & Northern.....	5-3	5-3			230,300	187,625	42,675		23%	376	300
St. Louis & Southeastern, St. Louis Div.....	201	201			219,051	227,640	-8,589		-4%	33-	192
Toledo, Wabash & Western.....	4-2	4-2			63,532	38,874	24,658		70%	749	813
West Wisconsin.....	197	176	21	19%	470,598	510,792	-40,194		-7%	412	476
Total.....	15,147	14,195	952	6%	\$12,405,963	\$11,373,093	\$1,032,870		9%	\$819	\$821
Total increase.....							1,032,870				

RAILROAD EARNINGS, FIVE MONTHS ENDING MAY 31.

NAME OF ROAD.	Mileage.		Increase.		Earnings.		Increase.	Decrease.	Per cent.	Earnings per Mile.				
	1873.	1872.	Miles.	P. c.	1873.	1872.				1873.	1872.	Inc.	Dec.	P. c.
Atlantic & Great Western.....	534	506	28	6%	\$2,019,091	\$1,898,220	\$120,871		6%	\$3,746	\$3,751		\$5	0%
Atlantic & Pacific.....	428	328	100	30%	514,550	417,622	96,928		23%	1,599	1,253	\$346		27%
Burlington, Cedar Rap. & Minn.....	334	361	27	8%	385,359	335,732	49,627		15%	1,154	1,256		132	10%
Central Pacific.....	1,218	1,094	124	11%	5,010,633	4,370,343	640,290		15%	4,114	3,925	189		5%
Chicago & Alton.....	649	623	26	4%	1,861,950	1,411,147			7%	3,096	3,047	49		1%
Chicago & Northwestern.....	1,395	1,353	42	3%	4,705,527	4,310,527	395,000		9%	3,373	3,234	139		4%
Cleveland, Col., Cin. & Indianapolis.....	470	390	80	20%	2,067,391	1,788,519	278,872		15%	4,364	4,586		202	4%
Erie.....	971	964	7	1%	2,458,414	2,387,554	70,860		3%	7,681	7,711		30	0%
Illinois Central.....	1,109	1,109			3,027,065	2,953,275	73,790		2%	2,730	2,663	67		2%
Indianapolis, Bloomington & W'n.....	344	312	32	61%	561,140	559,474	1,666		0%	2,358	2,397		229	9%
Kansas Pacific.....	672	672			1,338,133	1,266,391	71,742		6%	1,991	1,969	22		1%
Lake Shore & Mich. Southern.....	1,136	1,032	104	10%	2,848,488	2,149,702	698,786		15%	7,361	7,105	256		4%
Marquette & Cincinnati.....	284	284			829,390	750,341	79,049		10%	3,121	2,648	473		18%
Michigan Central.....	715	715			3,063,685	2,756,462	307,223		11%	4,224	3,855	369		10%
Milwaukee & St. Paul.....	1,167	1,059	108	10%	2,688,471	2,329,394	359,077		15%	2,304	2,206	104		5%
Missouri, Kansas & Texas.....	641	516	125	24%	1,184,094	536,236	647,858		12%	1,847	1,097	750		68%
Ohio & Mississippi.....	393	393			1,541,451	1,355,147	186,304		13%	3,924	3,447	477		14%
Pacific of Missouri.....	471	471			1,456,443	1,370,732	85,711		5%	3,092	3,642		550	15%
St. L., Alton & Terre Haute, N. W. Div.....	266	266			138,146	124,152	13,994		1%	3,189	2,156	1,033		48%
St. Louis & Iron Mountain.....	71	71			246,981	204,857	42,124		20%	3,400	3,921		521	13%
St. Louis, Kan. City & Northern.....	285	221	64	29%	968,966	878,336	90,630		10%	3,400	3,921		521	13%
St. Louis, Kansas City & Northern.....	5-3	5-3			1,091,629	1,157,830	-66,201		-5%	1,871	1,981		110	5%
Toledo, Wabash & Western.....	628	628			2,163,826	2,290,478	-126,652		-5%	3,446	3,647		201	5%
Total.....	14,563	13,577	986	7%	\$53,307,669	\$48,561,376	\$4,746,293		9%	\$3,654	\$3,578	\$76		2%
Total increase.....							4,746,293							

law in New York, where, in 1837, he began the practice of that profession, in which he soon took a high rank, having at one time, it is said, a larger chancery practice than any other man in the State. In 1856 he was chosen a member of the Thirty-fifth Congress as a Democrat, and served two terms, exercising a marked influence. In 1861 he resumed the practice of the law, but soon became interested in railroad business. In 1848 he had married a daughter of Cornelius Vanderbilt, then by no means so powerful as now in railroad management, but a very wealthy man and making way rapidly toward the controlling position which he now occupies. This connection, doubtless, together with his legal ability, brought him naturally into relations with railroad interests, and as early as 1857 he was a director of the New York & Harlem Company. Soon he took his place in the boards of nearly all the roads in which his father-in-law is interested, and latterly in others also, and was promoted to positions in which he exercised as much power probably as any one man on those boards. He was at times an active and very successful speculator, and secured in his own individual control immense interests in several companies; and usually it has been said of him, as it has been said of Vanderbilt, that when he came into a company "he came to stay;" that is, his speculations seemed to have for their object the permanent control of properties rather than the immediate profit from a rise in prices. In many enterprises he was usually associated with Augustus Schell, a lawyer and politician of some note, and James H. Banker, who is also, we believe, a son-in-law of Mr. Vanderbilt.

For some years before his death Mr. Clark was a director of the New York Central & Hudson River, and of the two companies which formed it, the New York & Harlem, the New York & New Haven, and the Lake Shore & Michigan Southern and the companies out of which it was formed. On the formation of the latter company by the consolidation of the different roads between Buffalo and Chicago, he became its President, and in the comparatively short time since he made most of his reputation as an administrative officer of great ability, energy and determination, so that at the time of his death he would doubtless have been generally ranked with the ablest men in the country holding similar positions. He showed a good comprehension of the necessities of traffic, rare independence and unsurpassable determination in deciding upon and carrying out policies, an appreciation of the value of ability and skill which led to a liberal policy which has enabled the company to secure a most capable staff of officers, and an enterprise and financial skill which have caused the company to provide more fully, perhaps, than any similar line for the enormous growth in traffic. He was fortunate in finding this road well officered, and doubtless it has been the knowledge of the staff which chiefly guided him, as indeed it must any executive who is less than omniscient.

His connection with this road doubtless gave him the place which he occupied to the time of his death as a director of the

Dunkirk, Warren & Pittsburgh, Erie & Pittsburgh and Toledo, Wabash & Western companies, and, until the late election, in the Cleveland, Columbus, Cincinnati & Indianapolis. He was for some years an active director of the Western Union Telegraph Company, and just before his death was chosen a director of the Shore Line Railroad Company of Connecticut. He had reached that position of reputation and influence in which his name was sought as a support in companies to which he could give very little thought.

In March, 1872, Mr. Clark, with others who were usually associated with him, were chosen directors of the Union Pacific Railroad Company, and Mr. Clark became President, to which office he was re-elected last March. It has been common to speak of this as one step in a preconceived plan to unite under one management a line from the Atlantic to the Pacific, and those who so believed thought their belief to be confirmed by the bold movement last fall by which Mr. Clark and a party with whom he had not been associated before secured control of a very large part—probably a majority—of the shares of the Chicago & Northwestern. But these people do not consider the very small value which the Union Pacific could have to the roads in which Mr. Clark was chiefly interested. The traffic, not large at best, must be pretty well divided before it reaches Chicago even, and a connection a hundred miles long in a State east of Chicago might easily give a more profitable traffic to the Lake Shore or the New York Central than the entire thousand miles of the Union Pacific. The Chicago & Northwestern probably brings to Chicago yearly for shipment eastward ten times as much traffic as passes the Union Pacific bridge at Omaha; but it is a question whether it was intended to make this road, or system of roads rather, a feeder of the Lake Shore as against its existing competitors so much as to prevent a combination with a new route. However this may be, Mr. Clark seems not to have obtained entire control of this company's stock, or else to have omitted to exercise it—which was not his way—for of the five or six directors chosen at the recent election, only one Lake Shore man was chosen, who, however, has since been made President.

Mr. Clark's death probably overturns many plans. The public has generally and naturally looked upon him as the probable successor of Cornelius Vanderbilt in most of the properties controlled by him, no one supposing that Mr. Clark would give place to a successor before his venerable father-in-law. He was President of the Union Trust Company, one of the most important financial institutions of New York, where he kept his office.

It may be imagined that a man who had become eminent in law, in politics and in railroad administration, possessed great versatility of mind. Perhaps his most prominent personal traits were tremendous industry and an indomitable will. He did not readily take a secondary position, but he exercised authority unhesitatingly, naturally and well.

The following resolutions were adopted at a special meeting of the board of directors of the Lake Shore & Michigan South-

ern Company, convened on account of its President's death:

Resolved, That the board of directors of the Lake Shore & Michigan Southern Railway Company have heard with feelings of the most painful regret of the death of our late much respected and esteemed associate and friend, Mr. Horace F. Clark, who for several years held the office of President of this company, and discharged his responsible and laborious duties with untiring industry and great ability, and with that high integrity which ever distinguished him in his whole professional and official life; that in his death we feel that we have lost an officer wise in counsel, prudent in action, honest in purpose, and who had the capacity to conceive great designs and the courage to execute them.

Resolved, That we tender to the family of our late honored President and valued friend the assurance of our warmest sympathies, and mourn with them their great and irreparable loss.

Resolved, That the board of directors, as a last tribute of respect, will attend the funeral to-morrow afternoon, at the church of the Rev. Dr. Adams.

Resolutions were also passed by the boards of the New York Central & Hudson River and the Western Union Telegraph companies.

The Dixon Bridge Letting.

The City Council of Dixon, Ill., recently advertised for bids for constructing a bridge to replace the one which fell down and caused so great a loss of life not long ago. The bridge is to consist of five spans of 132 feet each, and to have a roadway 18 feet and two sidewalks each 5 feet wide. The bids were as follows:

1. Kellogg Bridge Company, of Buffalo, \$98.74 per lineal foot; complete.
2. Kellogg Bridge Company, of Buffalo, \$82.57 per lineal foot; iron work alone.
3. L. Rust, of Cincinnati, \$75.10 per lineal foot; iron floor beams.
4. L. Rust, of Cincinnati, \$67.48 per lineal foot; wooden floor beams.
5. King Iron Bridge Company, of Cleveland, \$31.77 per lineal foot; wooden floor beams erected.
6. King Iron Bridge Company, of Cleveland, \$43.55 per lineal foot; iron floor beams with railing complete.
7. J. W. Shipman & Co., of Cincinnati, \$65 per lineal foot; complete.
8. American Bridge Company, of Chicago, \$49.50 per lineal foot; wooden floor beams, without railing.
9. American Bridge Company, of Chicago, \$35 per lineal foot; combination, without railing.
10. American Bridge Company, of Chicago, \$39.50 per lineal foot; Howe truss, without railing.
11. Buckeye Bridge Company, of Cleveland, \$37 per lineal foot; all iron complete.
12. Buckeye Bridge Company, of Cleveland, \$29 per lineal foot; wooden floor beams.
13. Phillipsburg Manufacturing Company, of Phillipsburg, N. J., \$58 per lineal foot; complete, without railing.
14. Phillipsburg Manufacturing Company, of Phillipsburg, N. J., \$32 per lineal foot; iron alone, erected without railing.
15. Canton Bridge Company, of Canton, O., \$43.30 per lineal foot; bowstring, 70 pounds per square foot, factor of safety of 5.
16. Canton Bridge Company, of Canton, O., \$38.61 per lineal foot; bowstring, 70 pounds per square foot, factor of safety of 4.
17. Canton Bridge Company, of Canton, O., \$57.18 per lineal foot; truss, 70 pounds per square foot, factor of safety of 5.
18. Canton Bridge Company, of Canton, O., \$51.40 per lineal foot; truss, 70 pounds per square foot, factor of safety of 4.
19. Detroit Bridge & Iron Works, of Detroit, \$60 per lineal foot; complete.
20. Smith Bridge Company, of Toledo, \$39 per lineal foot; wooden floor beams, proportioned for 3,000 pounds per foot.
21. Smith Bridge Company, of Toledo, \$55 per lineal foot; iron floor beams, proportioned for 3,000 pounds per foot.
22. Smith Bridge Company, of Toledo, \$30 per lineal foot; combination bridge proportioned for 3,000 pounds per foot.
23. Smith Bridge Company, of Toledo, \$19 per lineal foot; all wood, proportioned for 3,000 pounds per foot.
24. Smith Bridge Company, of Toledo, \$35 per lineal foot; Howe truss, proportioned for 3,000 pounds per foot.
25. Louisville Bridge & Iron Company, of Louisville, \$30.75 per lineal foot; iron floor beams.
26. Louisville Bridge & Iron Company, of Louisville, \$79 per lineal foot; wooden floor beams.
27. Louisville Bridge & Iron Company, of Louisville, \$32.75 per lineal foot; Howe truss combination.
28. Louisville Bridge & Iron Company, of Louisville, \$29.75 per lineal foot; Howe truss combination.
29. Cooper, of Albany, \$35 per lineal foot; iron floor beams complete.
30. Kingston Bridge Company of Pittsburgh, \$33.88 per lineal foot; complete.
31. L. W. Dinmore, of St. Joseph, Mo., \$33.50 per lineal foot; Howe truss.
32. L. W. Dinmore, of St. Joseph, Mo., \$23 per lineal foot; combination, wood floor beams.
33. L. W. Dinmore, of St. Joseph, Mo., \$37 per lineal foot; combination, iron floor beams.
34. L. W. Dinmore, of St. Joseph, Mo., \$24 per lineal foot; his old style.
35. M. Laessig, of Chicago, \$51.50 per lineal foot; iron floor beams.
36. M. Laessig, of Chicago, \$35.50 per lineal foot; combination bridge.
37. Spafford, of —, \$15 per lineal foot; Howe truss.
38. Spafford, of —, \$15 per lineal foot; another style.
39. Wells, French & Co., of Chicago, \$29 per lineal foot; Howe truss.
40. J. E. Josler, of Freeport, Ill., \$31.82 per lineal foot; patent wooden arch.
41. Phoenix Iron Co., of Phoenixville, Pa., \$34 per lineal foot; complete.

If some of the above tenders are accepted, we would recommend the enactment of a law forbidding baptisms in the vicinity of the bridge, as under the same circumstances the new bridge will be sure to fall down, as the old one did. The City Council of Dixon have apparently not learned any wisdom by experience, as we learn they have not made any specifications for the new structure, and, therefore, have received bids ranging from \$37 to \$93.74 per lineal foot for a bridge constructed of iron throughout, and from \$13 to \$29.75 for a wooden bridge. Verily the bridge doctors disagree.

THE TEXAS & PACIFIC RAILWAY, according to announcement made heretofore, will cross the mountains in California through the San Geronio Pass; but it has not generally been understood by what route the road would reach this pass, which is about 80 miles nearly due northeast from San Diego. California papers report that the route finally decided upon is from San Diego directly up the coast nearly 40 miles northward to the mouth of the San Luis Rey River, thence northeast through Santa Margarita Valley to Tamecula, and thence east by north to San Geronio Pass, making the distance something like 120 miles. From the Pass to the Colorado crossing the distance will be nearly due southeast, and the first 160 miles of the road will thus form nearly three sides of a parallelogram. At San Geronio Pass the distance to Fort Yuma is but about 25 miles longer than the straight line from San Diego to Fort

Yuma, which latter is, however, impracticable for a railroad. By this arrangement Los Angeles and San Diego will be about equally distant from all points on the Texas & Pacific east of San Geronio Pass, and the wisdom of making San Diego the terminus and the possibility of making traffic go there when the road is built seem very questionable. The parts of the line west of the Pass may, however, be worth building, as they will be almost the only parts of the line in California from which any considerable local traffic can be expected. But they may take the position of branch lines, while the through traffic goes up by the Southern Pacific of California to San Francisco—where, by the way, the Pacific coast traffic is pretty sure to go in spite of all efforts to divert it.

MR. ALBERT KEEF, who has been chosen to succeed Mr. John F. Tracy as President of the Chicago & Northwestern Railway Company, is a wealthy resident of Chicago, formerly in active business there, and now a large land owner in the city. He is but distantly, if at all, related to the late Henry Keef, who was President of the company four or five years ago, and is not known to have been connected with him in any of his railroad enterprises and speculations, though he has been for some time in the Michigan Southern, in which Mr. Henry Keef had a very large interest at one time. Mr. Albert Keef is a director in the Lake Shore & Michigan Southern at the present time, and is probably the representative of a number of the largest Northwestern stockholders (who have been known as the "Horace F. Clark party"), several of whom (but not all) are also leading men in the Lake Shore; but he was probably more acceptable to the older management than Mr. Clark would have been, or another of this party more closely connected with the Lake Shore administration. He entered the Northwestern board at the election on the 5th inst., succeeding Mr. John M. Burke, of New York, being the only new director.

Mr. Keef is reported to be a man of extremely agreeable manner, and likely to be a popular officer, as well as an honorable and faithful one.

THE NATIONAL CAR-BUILDER for July will contain the official report of the last convention of the Master Car-Builders' Association, with all the committee reports, except the long one on brakes, and the debates nearly verbatim, like that on the subject of car-axle journals in this number of the RAILROAD GAZETTE, which is taken from this report. The official report will contain besides what is published in the Car-Builders' report of the Committee on Brakes and that of the Master Mechanics' Association Committee on Axles, which was read at the Master Car-Builders' Convention and is printed with the discussion on journals in this paper.

The Chicago Free-Pass Resolutions.

The following are the resolutions concerning the practice of issuing free passes as finally approved by the Chicago companies:

Whereas, It is believed that the issuing of free passes and the granting to certain classes of people the right to travel upon railways without the payment of fare, while the rest of the traveling public are required to pay, is a cause of frequent and well-founded dissatisfaction, and, in practice, is shown to be inconsistent with proper railroad management, and is in violation of the true interests of the share and bondholders; it is, therefore,

Resolved, That from and after the 30th day of June, 1873, the whole system of issuing free passes and granting free travel over and upon the roads represented at this meeting shall be abolished and wholly and forever discontinued, and all outstanding passes, whether season or trip, shall be recalled and canceled, and that, after that date, no free passes or tickets for which the full regular passenger fare is not paid shall be authorized or issued, directly or indirectly, in any form, by any railroad company here represented, or its agents, over its road, or any part of the same, to any person or persons, or for any purpose whatsoever; but that, aside from the officers, agents or employees of said respective railroad companies while traveling over their own roads or while employed in the service of their own respective companies, all persons and classes of persons shall alike be required to pay the usual and established fare; provided,

First—That agreement shall not extend to cases in which any of the companies signing this agreement are bound to issue passes by virtue of leases or other lines or by existing written contracts; provided,

Second—That attorneys shall not be considered employees entitled to passes under this resolution, unless they are regularly retained as salaried officers; provided,

Third, That all annual passes which have been issued may remain outstanding and in force until the 31st day of December next, but none shall be renewed or others issued; provided,

Fourth, That each company may authorize the wives and children of the officers and employees of the companies to travel without the payment of fare on their own roads at the discretion of the President or Superintendent of the respective roads.

Resolved, That the railroad companies here represented by their officers hereby pledge themselves to maintain and carry into effect the above resolutions in their full purport and intent; that they cause their respective names to be hereto subscribed, and that all other railroad companies be requested to join in this action and become parties hereto by causing their names to be hereto subscribed.

The undersigned railroad companies agree each with the other to keep, strictly to observe, maintain and carry into effect the provisions of the foregoing resolutions to their full meaning and intent.

Signed by the representatives of the

Chicago & Northwestern Railway.
Chicago & Iowa Railroad.
Chicago, Milwaukee & St. Paul Railway.
Chicago, Rock Island & Pacific Railroad.
Chicago, Burlington & Quincy Railroad.
Chicago & Alton Railroad.
Illinois Central Railroad.

—The directors of the Winona & Southwestern Railroad Company, recently elected, are classified as follows: To hold office for one year—E. S. Youmans, H. M. Burchard, H. W. Lambertson, Wm. Mitchell; for two years—J. C. Easton, Wm. Windom, Wm. H. Yale, John A. Mathews; for three years—B. D. Cone, John Robson, M. G. Norton, Thomas Simpson. The members of the Executive Committee are: Wm. Mitchell, Thomas Simpson, M. G. Norton, H. W. Lambertson, H. M. Burchard.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

—The new board of directors of the Peoria, Pekin & Jacksonville Railroad Company has re-elected John Allen, President, and Lebbeus Chapman, Jr., Secretary.

—Mr. J. W. Moore has been elected President of the Bangor & Calais Shore Line Railroad Company.

—Col. O. N. Lull, long Superintendent and Engineer of the Cumberland Valley Railroad, will, after July 1, be Chief Engineer, in charge of roadway and equipment. Mr. J. F. Boyd, formerly General Superintendent of the St. Louis & Southeastern, has been appointed Superintendent of the road.

—At the annual meeting of the Indianapolis, Cincinnati & Lafayette Railroad Company in Indianapolis, Ind., June 18, the following board of directors was chosen: W. A. Booth, G. A. Bliss, J. A. Roosevelt, New York; T. A. Perkins, Boston; J. H. Bates, J. S. Kennedy, Cincinnati; G. H. Chapman, Indianapolis. William A. Booth was chosen President.

—At the meeting of the directors of the St. Paul & Sioux City Railroad Company in St. Paul, June 18, the old officers were re-elected for the ensuing year as follows: President, E. F. Drake; Vice-President, J. L. Merriam; Treasurer, H. Thompson; Secretary, G. A. Hamilton.

—At the annual meeting of the Chicago, Danville & Vincennes Railroad Company in Chicago, January 19, the following directors were elected: James W. Elwell, James D. Fish, Amos Tenney, Matthew Taylor, W. D. Judson, New York; John Tenney, Boston; Alvin Gilbert, Rossville, Ill.; John L. Donovan, Watsela, Ill.; George Nebecker, Covington, Ind. The directors at a subsequent meeting re-elected the old officers, as follows: W. D. Judson, President; Amos Tenney, Treasurer; J. S. Campbell, Secretary; Joseph E. Young, Manager.

—Mr. Otis Willis, long a conductor on the road, has been appointed Assistant Superintendent of the Prairie du Chien Division of the Milwaukee & St. Paul Railway.

—The bondholders of the Ware River Railroad Company met in Ware, Mass., recently, and organized a new company (by the same name) by the election of the following directors: Chester W. Chapin, J. A. Rumrill, Springfield, Mass.; C. A. Stephens, Ware, Mass.; F. Morgan, Palmer, Mass.; E. B. Gillett, Westfield, Mass.; William Mixer, Hardwick, Mass.; W. W. Whitney, Winchendon, Mass.; C. A. Porley, Baldwinville, Mass.; Lewis May, New York. The board organized by electing officers as follows: President, James A. Rumrill; Clerk and Treasurer, William Ritchie.

—The directors of the United New Jersey Railroad & Canal Company met in Trenton, N. J., June 17, and re-elected the old officers for the ensuing year, as follows: President, John G. Stevens; Vice-President, Alfred L. Dennis; Secretary and Treasurer, Richard F. Stevens.

—Mr. Dyer Williams has been appointed Superintendent of the Cayuga Lake Railroad, with headquarters at Aurora, N. Y. Mr. Williams was formerly on the New York Central, but for some years past has been engaged in manufacturing.

—Mr. James T. Van Horn, formerly of the East Pennsylvania Railroad, has been appointed Master Mechanic of the Wilmington & Reading Railroad, in place of Abram Brandt, resigned.

—At a meeting of the directors of the Chicago & Northwestern Railway Company, June 19, Mr. Albert Keef, of Chicago, was chosen President, in place of John F. Tracy, resigned. Mr. M. L. Sykes, Jr., the Vice-President, was chosen also Secretary and Treasurer, in place of C. R. Marvin, who has resigned. Mr. S. O. Howe was elected Assistant Secretary and Treasurer, a new office. The two last appointments to take effect July 1.

—Mr. R. A. Anzer, long Trunk Master of the New York Central Railroad, has accepted an appointment as Superintendent of Track of the Canada Southern Railway, with office at St. Thomas, Ont.

—Mr. Mark M. Towne, late Assistant Superintendent of the Atchison & Nebraska Railroad, has accepted an appointment as Superintendent of the Eastern Division of the Missouri, Kansas & Texas Railway (Hannibal to Sedalia, Mo.), with office at Hannibal, where one brother (H. A. Towne) is Master Mechanic of the Hannibal & St. Joseph Railroad, and another brother (L. W. Towne) is Assistant Superintendent of the same road; a third brother, A. N. Towne, being General Superintendent of the Central Pacific Railroad. Mr. M. M. Towne is the youngest of this railroad family, being about 27 years of age. For several years, and until about a year ago, he was Train Dispatcher on the Iowa Division of the Chicago & Northwestern Railway, at Boone, Iowa.

—At the adjourned annual meeting of the stockholders of the Atlantic & Pacific Railroad Company, held in New York, June 24, the following board of directors was elected: Frederick Billings, Woodstock, Vt.; Oliver Ames, North Easton, Mass.; Uriel Crocker, George S. Curtis, Francis B. Hayes, Charles J. Morrill, Boston, Mass.; E. E. Bishop, Bridgeport, Conn.; W. R. Garrison, Joseph Seligman, William H. Coffin, Andrew V. Stout, New York; Andrew Pierce, Jr., St. Louis; Ozias Bailey, White Cloud, Kan. The new directors are Messrs. Bishop and Garrison, who fill the places of Jacob Sleeper, of Boston, and Joseph Brown, of St. Louis, the latter, however, having resigned his position on the board some months ago.

—At the annual meeting of the Grand Rapids, Newaygo & Lake Shore Railroad Company in Grand Rapids, Mich., June 19, J. W. Converse, L. H. Randall, D. P. Clay, E. L. Gray, W. D. Fuller, C. Warner, W. D. Foster, E. P. Fuller and E. Bradford were chosen directors. The directors elected D. P. Clay, President; C. Warner, Secretary; E. P. Fuller, Treasurer, and D. P. Clay, C. Warner and W. D. Foster the Executive Committee.

—At a meeting of the directors of the Washington City, Virginia, Midland & Great Southern Railroad Company in Alexandria, Va., June 20, William G. Casenove was elected Vice-President of the company.

—At a meeting of the incorporators and subscribers to the stock of the North & South Jersey Railroad Company, in Trenton, N. J., June 17, the following board of directors was elected: Joseph D. Pancoast, Joseph R. Lippincott, Salem, N. J.; Samuel H. Robbins, Allentown, N. J.; Randall E. Morgan, Camden, N. J.; Edwin A. Ford, Bordentown, N. J.; A. G. Ritchie, Trenton, N. J.; Edward Howe, Princeton, N. J.; William Bell, Perth Amboy, N. J.; Benjamin F. Smith, New York.

—The Wisconsin Railroad Company, formed to take the St. Croix land grant and build the roads required, was organized in Milwaukee, June 18, by the election of the following officers: President, John W. Cary; Vice-President, Wm. Wilson; Treasurer, J. M. Whiting; Secretary, D. C. Green; directors, Wm. Wilson, J. H. Knapp, Menominee, Wis.; Thad. C. Pound, Chippewa Falls, Wis.; B. F. Watson, Eau Claire, Wis.; J. F. Gilbert, John W. Cary, J. M. Whaling, Milwaukee, Wis.; John Lawler, Prairie du Chien, Wis.; O. S. Powell, River Falls, Wis.; P. C. Boyden, D. D. Campbell, Hudson, Wis.; John Moloy, Lafayette, Wis.

—A circular from the offices of the Atlantic & Great Western Railroad Company announces the following changes: "Mr. J. H. Devreux is hereby appointed General Manager of the company's lines and property, his appointment to take effect from this date. Mr. James B. Hodgskin, Vice-President, is relieved from duty at Meadville, in accordance with the annexed resolution."

tions of the Executive Committee, and will return to New York."

The resolutions of the Executive Committee are as follows:

"Whereas, Mr. Jas. B. Hodgskin, Vice-President and Treasurer, has fully and satisfactorily accomplished the objects for which he was temporarily placed in charge of the road at Meadville, Pa., and

"Whereas, The recent appointment of Mr. J. H. Devereux as General Manager of the company will permit Mr. Hodgskin to return to New York, where his services are required in the general offices of the company, therefore be it

"Resolved, That Mr. Hodgskin be authorized to transfer all control of the road to the General Manager at Meadville, and return to New York.

"Resolved, That the thanks of the Executive Committee and of the company are due to Mr. Hodgskin for his very able and satisfactory discharge of the trusts committed to him; and that these resolutions be published in full upon the general order announcing Mr. Devereux's appointment."

"In spite of an injunction from the Circuit Court at St. Louis, a meeting of the stockholders of the Laclede & Fort Scott Railroad Company was held in St. Louis, June 16, at which the following were elected directors for the ensuing year: George E. Merrick, G. A. Fitch, A. C. Mitchell, John Hogan, C. G. Harris, S. W. Calhoun and Merrill Ladd.

"At a meeting of the directors of the Baltimore & Drum Point Railroad Company, held June 13, the following officers were elected: President, Daniel R. Magruder; Vice-President and General Manager, William R. Hutton; Treasurer, Gen. George H. Stuart; Secretary and Assistant Treasurer, John G. Butler; Executive Committee, F. L. Barreda, Jas. Webb, D. R. Magruder, Vernon H. Brown, Isaac Solomon and William R. Hutton, ex officio.

"The board of directors of the Canton Company has appointed the following Executive Committee: Chas. J. Baker, President; Geo. S. Brown, of Baltimore, Vice-President; S. L. M. Barlow, Wm. Butler Duncan and Jas. H. Banker.

"At the annual meeting of the Syracuse Northern Railroad Company, held June 9, the following were elected directors for the ensuing year: James J. Belden, Allen Monroe, William H. Carter, James A. Clark, Orin R. Earl, Frank Hiseock, Jacob S. Smith, Lucius Gleason, Thomas Gale, William T. Hamilton.

"Mr. A. L. Crawford, of Newcastle, Pa., is President; Wm. Brewster, of Erie, Pa., Secretary and Treasurer, and J. W. Blanchard, formerly of Newcastle, Pa., Superintendent of the St. Louis, Salem & Little Rock Railroad.

"At a meeting of the stockholders of the Salina, Atlanta & Raymond Railroad Company at Salina, Kan., June 18, the following board of directors was elected for the ensuing year: Robert Morrow, S. W. Cory, Abram Cutler, A. D. Searl, Lawrence, Kan.; D. R. Wagstaff, J. H. Prescott, Salina, Kan.; T. E. Simpson, McPherson, Kan.; Z. H. Cory, Leavenworth, Kan.; M. V. Cutler, Dodge City, Kan. At a subsequent meeting the board elected the following officers: President, J. H. Prescott; Vice-President, Robert Morrow; Secretary, D. R. Wagstaff; Treasurer, Z. H. Cory; General Manager and Superintendent, Abram Cutler; Chief Engineer, A. D. Searl.

"At the annual meeting of the Manchester & Lawrence Railroad Company in Manchester, N. H., May 30, the following directors were elected: Ezekiel A. Straw, Benjamin F. Martin, Nathan Parker, Aretas Blood, Manchester, N. H.; Edward A. Abbott, Concord, N. H.; William W. Stickney, Exeter, N. H.; Joseph W. Smith, Andover, N. H.

"At the annual meeting of the Wilton Railroad Company in Nashua, N. H., May 23, the following officers were elected: Clerk, J. Thornton Greeley; Treasurer, Theodore H. Wood; directors, William W. Bailey, Isaac Spaulding, William Ramsdell, Clark O. Boutwell, John Reed.

CHICAGO RAILROAD NEWS.

Chicago & Paducah.

This road is being pushed rapidly forward, track-laying being done at both ends. The track is now laid from Fairbury to Gibson, the point where the line crosses the Bloomington Branch of the Toledo, Wabash & Western road, a distance of 25 miles from the point above named. Ten miles of track have also been laid from Monticello northward. There remains a gap of 25 miles to join the two sections of road, and it is believed that this will be put in and trains be running from Streator to Windsor by the 10th of July.

Pullman Palace Car Company.

This company has removed its general offices to the northwest corner of Adams street and Michigan avenue. Six magnificent palace cars were shipped last week for England, where they are to run upon the Midland Railway, and it is expected that this is but the first installment of many similar shipments in the future. The Vice President of the company is about to start for Europe to superintend the introduction of the sleeping cars upon European roads.

Michigan Central.

This company has commenced the construction of a grain elevator at Detroit having a capacity of 800,000 bushels. The Jackson, Lansing & Saginaw Division has just been ballasted from Crawford to Osage Lake, a distance of 20 miles, and the route thence to the Straits has been surveyed by several lines, but the exact location of that portion of the road has not been definitely fixed.

Passenger Tariffs.

These have not all been made out yet. Some excitement has been created in this city by an announcement that the Illinois Central had increased its fares to suburban stations. But while single fares are higher, the company will sell commutation tickets at the old rates. The general passenger tariff on the Illinois Central will remain about as it has been heretofore. The new passenger tariff of the Chicago, Rock Island & Pacific Company has been completed, and is as follows:

STATIONS.	MILES.	FARE.	STATIONS.	MILES.	FARE.
Chicago.....	4.85	\$.35	Putnam.....	121.96	\$4.35
R. I. Shops.....	6.46	.40	Henry.....	127.47	4.55
Englewood.....	7.34	.40	Spartan.....	134.49	4.70
Normal.....	8.78	.45	Chillicothe.....	142.44	5.95
Auburn.....	11.39	.55	Rome.....	145.39	5.95
Wash'n Heights.....	15.75	.70	Kennett.....	150.94	5.25
Blue Island.....	23.46	.95	Peoria.....	166.75	5.50
Bremen.....	29.69	1.20	Tiskilwa.....	192.37	4.35
Mokena.....	34.04	1.35	Pond Creek.....	129.56	4.60
New Lenox.....	40.42	1.55	C. B. & Q. Crossing.....	129.56	4.60
Joliet.....	45	1.75	Sheffield.....	136.66	4.80
Troy.....	51.09	1.95	Mineral.....	142.68	4.95
Minooka.....	58	2.20	Annawan.....	145.68	5.05
Aux. Sabie.....	61.71	2.30	Atkinson.....	151.60	5.20
Morris.....	71.92	2.65	Geneseo.....	159.09	4.45
Seneca.....	77.27	2.80	Green River.....	167.89	5.75
Marseilles.....	84.42	3.05	Colona.....	169.54	5.80
Ottawa.....	93.88	3.35	Carbon Cliff.....	171.81	5.85
Utica.....	98.78	3.55	Port Byron Junction.....	175.26	5.95
La Salle.....	99.95	3.60	Moline.....	179.49	6.10
Peru.....	109.88	3.90	Rock Island.....	181.45	6.15
DePue.....	114.08	4.05	Davenport.....	182.64	6.25
Bureau.....					

The new rates are a reduction from the old ones, amounting to from 8 to 15 per cent., and in a few instances to more than that. Both railroad men and intelligent farmers feel that the new law is an experiment, and that while it will serve to bring to the attention certain facts which the general public never

knew before, it will need revising at the very first session of the Legislature, which will be held next January. Meanwhile the working of the law will be watched with the keenest interest by all parties.

The New Freight Rates.

These will generally go into effect promptly on the first day of July. After that no favors will be shown to any one, and shippers will be obliged to take their turn as people do in voting or calling for letters at the post-office. At present there is a good deal of anxiety on the Chicago & Alton and the Illinois Central roads on the part of shippers to get lumber and grain to their destinations before the first of July, on the favorable terms which the old law permits, and the consequence is that the demand for cars on these roads very much exceeds the supply. Orders have been given by Mr. Tucker, General Freight Agent of the Illinois Central road, to bill all freight after midnight on the 30th inst. at the new schedule rates, which will be substantially similar to those of the Chicago & Alton Company. The new freight tariff of the Illinois Central is not yet completed, for the reason that it depends very much upon the tariffs of other competing roads; but it will be promulgated in time.

Chicago, Burlington & Quincy.

This company has removed the tools and machinery in the Quincy shops to Creston, Iowa, for use in the division shops of the leased Burlington & Missouri River road at that place.

The change of freight tariff on the 1st prox. is supposed to necessitate the abandonment of most of the through business at that place to the Toledo, Wabash & Western, which has the short line eastward; and this latter company is reported to be preparing to abandon its present Quincy line, and to connect with that place only by local trains on the Quincy, Alton & St. Louis road to its Hannibal line.

PERSONAL.

—Mr. Charles O. Russell, Superintendent of the Boston & Albany Railroad, was married recently to Miss Eugenia Bradley, at Meriden, Conn.

—Mr. Edward Benham, General Freight Agent of the Cincinnati, Wabash & Michigan Railroad, while riding on a train about six miles south of Goshen, Ind., leaned over from the platform of the car in order to throw a message to some workmen, in doing which his head struck a post and he was thrown under the car and killed.

—Mr. F. R. Myers, General Passenger and Ticket Agent of the Pennsylvania Company, has taken up his residence at Canton, O., on the Fort Wayne road, 101 miles from Pittsburgh.

TRAFFIC AND EARNINGS.

—The earnings of the Toronto, Grey & Bruce Railway for the month of May were: 1873, \$19,776; 1872, \$9,060; increase, \$10,716, or 118 1/2 per cent. The earnings for the five months ending May 31 were \$77,605, or \$392 per mile.

—The earnings of the Erie Railway for the week ending June 15 were: 1873, \$414,418; 1872, \$393,219; increase, \$21,199, or 5 1/2 per cent.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the first week in June were \$29,048.72. The earnings of the St. Louis Division for the week were: 1873, \$16,936.35; 1872, \$11,151.55; increase, \$5,784.80, or 51 1/2 per cent.

—The earnings of the Milwaukee & St. Paul Railway for the second week in June were: 1873, \$212,403; 1872, \$133,217; increase, \$79,186, or 59 1/2 per cent.

—The earnings of the Chicago & Northwestern Railway for the first two weeks in June were as follows:

	1872.	1873.
Passengers.....	\$131,943.80	\$141,562.20
Freight.....	\$30,370.20	\$48,305.00
Express.....	8,758.80	8,410.80
Mail.....	7,635.16	7,275.84
Total.....	\$178,718.00	\$205,553.84

The increase this year over last was \$137,555.88, or 29 1/2 per cent.

—The number of through passengers carried over the Central Pacific Railroad during the month of May was: Eastward, 2,799; westward, 6,025; total, 8,824. As compared with the same month last year there is an increase of 2,038 (236 eastward and 1,752 westward) passengers, or 30 per cent.

—The earnings of the Great Western Railway of Canada for the week ending June 6 were: 1873, \$23,452; 1872, \$21,186; increase, \$2,266, or 10 1/2 per cent.

—The earnings of the Grand Trunk Railway of Canada for the week ending June 7 were: 1873, \$36,900; 1872, \$35,300; increase, \$1,600, or 4 1/2 per cent.

—The earnings of the Kansas Pacific Railway for the week ending June 15 were: Passengers, \$30,411.45; freight, \$38,855.13; mails, \$2,055.31; total, \$71,321.89. Of this amount, \$8,110.64 was for transportation of troops, mails and government freight.

THE SCRAP HEAP.

Sleeping Cars in Germany.

A Potsdam letter, dated May 26, says: "To-day the three first cars of the 'Compagnie internationale de wagons lits' (International Sleeping-Car Company) passed our station, on their way to Berlin. These are to be used for the express trains between Berlin and Ostende, and are fitted with all imaginable luxury. We get into an entry, arranged for the servants; on the right is the first and on the left is the second class. They contain besides the comforts for the journey by day complete arrangement for seven sleeping places, including washing apartments and closets, and are connected by telegraph wire to the places where the servants stay, and are fitted out with more luxury than the finest cabins of the best steamers. So carefully has provision been made for every need that the berths are supplied with small steps to descend. To travel in one of these cars three days and three nights is no trial even to feeble and sick passengers. The Berlin-Potsdam-Magdeburg Railroad Company has bought a considerable number of these cars, which make the journey to the celebrated bathing-place of Ostende very pleasant to the public."

Corrosion of Stay-Bolts.

Mr. John Cochran, of New York, has taken out a patent for preventing the corrosion of stay-bolts in boilers by case hardening them, which, he says in his specifications, will make them as durable as plate iron.

Trial of a Light Rail.

The Mobile & Ohio Company has laid in its yard in Mobile 100 yards of a light rail invented by Mr. H. G. Angle, of Chicago. The rail, which weighs 25 1/2 pounds per yard, is rolled nearly in the form of a common angle-iron, and bolted on a stringer of wood, 5 by 6 inches, which is spiked down to the ties, from which the ordinary rails have been removed. Should it stand the severe test to which it is subjected in the yard, the company will lay it on all its branch lines. The cost is stated to be about 30 per cent. less than that of a 50-pound T rail.

Manchester Locomotive Works.

About 600 men are now employed at this establishment at work on orders for the Wilmington & Weldon, Charlotte, Columbia & Augusta, Montpelier & Wells River and Grand Trunk roads.

OLD AND NEW ROADS.

[CONTINUED FROM PAGE 261.]

Texas & Pacific.

A correspondent says that regular trains are now running from Shreveport west to Gladewater and from Dallas east to Terrell. The depots and water tanks are all completed and in order and the necessary sidings laid. The gap of 54 miles between the east and west ends of the track is all graded and bridged, and it is expected that the two parties of track-layers will meet at the Sabine River about August 1. Track-laying will then be commenced on the Trans-Continental Division from Sherman eastward, and also on the line from Jefferson south to Marshall.

Chicago & Pacific.

A suit was lately brought against this company in the United States Circuit Court at Chicago, by W. G. Wiley, a stockholder of the Chicago & Northwestern residing in New York, to restrain the company from condemning a portion of the Northwestern's right of way at Elgin, Ill. This is substantially the same case that was recently decided in favor of the Chicago & Pacific in the Kane County (Ill.) Circuit Court. In the United States Court, Judge Drummond gave his decision June 19. He refused to grant the injunction, and while criticising somewhat the decision of the State Court, he decided that the United States Court had no right to interfere with that decision, or to review it. The remedy open to the Northwestern Company or to its stockholders was an appeal to the Supreme Court of the State, and not to the United States.

Canada Pacific.

The Toronto (Canada) Mail of June 21 says:

"We are informed on good authority that a meeting of the Directors of the Canada Pacific Railway Company has been called for the 4th of July in Montreal, to ratify an agreement entered into with parties in England. It is believed that the agreement is of a kind which will commend itself to the board, and that the country may confidently look forward to the success of the enterprise."

The London correspondent of the Toronto Globe in a recent letter stated that the financiers with whom the company was negotiating for a part of the money needed had required the company to obtain some further authority from the Canadian Government in order that the English capitalists might be fully secured.

Central Pacific.

A late San Francisco dispatch says: "The sale of the interest of Huntington and Hopkins in the Central Pacific Railroad is so nearly consummated that it is given out that the new board of directors will take charge of the road on July 1. Huntington and Hopkins retain one share each, and remain, for the present, in the board. The new board will be as follows: Leland Stanford, President, and Messrs. D. O. Mills, Wm. Sharon, C. F. Huntington, Michael Reese, Mark Hopkins and A. A. Cohen, directors."

Buffalo & Jamestown.

The Comptroller of the city of Buffalo has issued to this company \$75,000 of the bonds voted to the road, in exchange for a like amount of the stock of the company.

Cincinnati Southern.

It is reported that the Southern Security Company is making efforts to secure the adoption of the line to Knoxville instead of that to Chattanooga. In case the Knoxville line is adopted, it is said that the company will bid for and, if possible, secure the contract for the construction of the line through Kentucky.

New York Central & Hudson River.

The substitution of steel for iron rails in both tracks between Albany and Buffalo is completed, the last steel rail having been put down last week near Oneida. The Hudson River Division has been laid with steel for several years past.

The Saratoga special express on the Hudson River Division was put on June 23. It leaves New York at 9:30 A. M., and Saratoga at 3 P. M. A special train to Saratoga is also run on Sundays.

Railroad Taxation in New Jersey.

The State Commissioner of Railroad Taxation in New Jersey recently notified the different companies interested of the assessments made on their property in Hudson County, and requested them to appear before him, as required by the new law, and present their statements. Only one company, the Morris & Essex, appeared. The various companies whose roads pass through Essex County have been notified to appear June 24. Under the law, the State Commissioner receives the assessments made by the county or city assessors, and after hearing the statement of the company, fixes the valuation.

It is understood that legal steps will be taken to test the validity of the law, and for that reason the railroad companies have refused to comply with it.

New Haven, Middletown & Willimantic.

The ballasting of the road is complete and local trains are running to East Hampton. The through trains from Boston to New York will be put on as soon as the necessary rolling-stock can be procured.

Pittsburgh, Fort Wayne & Chicago.

The contract for the grading and masonry for 15 miles of the second track between Mansfield and Crestline has been awarded to Stanley & Brother, of Conneaut, O. The same parties have also a contract for grading second track on the Lake Shore & Michigan Southern, between Elkhart and Laporte.

Regulating Freight Rates in Delaware.

The Court of Errors and Appeals of Delaware have pronounced unconstitutional the section of the railroad tax bill which provided for the regulation of fares and freights. The bill provided that all charges should be in proportion to the distance.

United States Railroad Mutual Life Insurance Association.

The fourth annual convention of this Association was held in St. Louis June 18, a large number of delegates being present. The report of the Secretary showed the receipts to have been \$3,883.32, which included \$781 entrance fees. The expenditures had been \$2,132.33, and there was a balance of \$2,112 in the hands of the Treasurer. During the year \$32,926 was collected on assessments, and \$31,155 paid to the families of deceased members. There had been twenty-one deaths. The Association has members among the employees of 134 different railroads.

Several amendments to the constitution were proposed and acted upon. A proposition to extend the limit of insurance from \$3,000 to \$5,000 was laid over to the next convention.

The following officers were chosen for the ensuing year: President, Franklin Fairman, Chicago; Vice-Presidents, H. S. De Pew, St. Louis, Alton & Terre Haute Railroad; W. Beadle, New York, New Haven & Hartford; J. E. Carnell, Kansas Pacific; John W. Renner, Pittsburgh, Cincinnati & St. Louis; H. C. Inman, Jefferson, Madison & Indianapolis. Executive Com-

mittee, W. H. Stennett, Illinois Central; Chas. McGinley, Philadelphia & Reading; O. P. McCarty, Indianapolis, Bloomington & Western; E. T. Roberts, Philadelphia, Wilmington & Baltimore; P. H. Murphy, Illinois Central. Finance Committee, D. McKnight, Pennsylvania; Morton Mills, West Jersey; T. W. Dunn, United Railroads of New Jersey.

The next convention is to be held in Richmond, Va., on the third Wednesday in April, 1874.

New Bedford.

The extension of this road from its former terminus in New Bedford to tide water is substantially complete and will be opened with a celebration which is to take place June 30.

A new freight line has been organized to run from Lowell, Mass., to New York, by way of New Bedford, going from New Bedford to New York by steamer.

Vermont Central.

The petition of the trustees of the Vermont Central and Vermont & Canada roads, and of the new Central Vermont Company, to have the Central Vermont Company appointed Receiver of the road and the trustees relieved from the charge, came up before Chancellor Royce, at St. Albans, June 12. Representatives of the Vermont Central and Vermont & Canada bondholders asked for a delay in relieving the trustees of their obligations until they should file and settle their accounts. After hearing arguments, the case was adjourned until June 19.

After the adjourned hearing, the Court decided to grant the petition, and the Central Vermont Company was appointed Receiver of the road. The property will be transferred to its possession as soon as possible.

By agreement the petition of the Vermont & Canada Company for leave to bring suit against the trustees for arrears of rent was left open to be heard hereafter.

The bridge over the Winoski River near Waterbury, Vt., which was about 430 feet long, was destroyed by fire last week, having caught from sparks from a locomotive. A temporary trestlework on which trains could pass over the river was constructed by Mr. C. H. Clark, Master Bridge Builder, in 29 working hours. Much of the timber was brought from Canada.

Dividends.

The Delaware, Lackawanna & Western Company (lessees) will pay the regular semi-annual dividend of 3½ per cent. on the stock of the Morris & Essex Railroad Company July 1.

The Delaware, Lackawanna & Western Railroad Company will pay a dividend of 5 per cent. July 15. Transfer books will be reopened July 21.

A dividend of 3½ per cent. on the preferred stock of the Chicago & Northwestern Company has been declared, payable July 15. Transfer books will be closed June 23 and reopened July 15.

A dividend of 3 per cent. on the stock of the Syracuse, Binghamton & New York Railroad Company (whose road is leased by the Delaware, Lackawanna & Western Company) will be paid July 1.

The regular quarterly dividend of 2½ per cent. on the stock of the United New Jersey Railroad & Canal Company will be paid on and after July 10.

The Second Avenue (New York) Railroad Company will pay a dividend of \$2 per share July 10.

Wells, Fargo & Co. divide 5 per cent. July 5.

The Illinois Central pays its usual half-yearly dividend of 5 per cent. August 11. Transfers close July 15.

A dividend of 5 per cent. will be paid on the stock of the Norwich & Worcester Railroad Company July 7.

New Jersey Midland.

This company advertises for proposals for \$600,000 of consolidated mortgage bonds of the company. The bonds have 50 years to run, bear 7 per cent. interest, payable semi-annually, and the interest and principal are payable in gold. Proposals in amounts not less than \$10,000 will be received at the Treasurer's office, No. 25 Nassau street, New York, up to noon of July 8. A certified check for 5 per cent. of the amount proposed for must accompany each bid. The bonds will be ready for delivery July 9. The company states that "these bonds are secured by a mortgage upon the road, with its water front, ferry and franchises, which provides for the funding and retiring of the present indebtedness of the company, for improving, developing the water front and docks at Weehawken, for double-tracking the main line of the road with steel rails, and for extending the road to the connection with the coal fields at the Delaware River."

The road, which is now operated under a temporary lease by the New York & Oswego Midland Company, is about 72 miles long, from the junction with the Pennsylvania Railroad, near Jersey City, to Unionville, N. Y. There is, we believe, a first mortgage of \$3,000,000 and a second mortgage of \$1,500,000 on the road. The authorized capital stock is \$2,000,000, of which at last reports \$1,600,000 had been paid in, making the whole capital account \$6,100,000, or about \$85,000 per mile. The company has published no statement of its condition recently.

Eastern.

The bill authorizing the building of the short cut or branch line to connect the Portsmouth, Great Falls & Conway road with the new Portsmouth & Dover road has passed the New Hampshire Legislature.

It is said that this company, in connection with the Maine Central and Portland & Rochester, will shortly build a new and handsome passenger depot on the Back Bay, at Portland, Maine.

Portsmouth & Dover.

The work on this road is being rapidly pushed forward. The foundations of the bridge over the Cochecho, which will be about 475 feet long and 50 feet above the water, are being laid. The bridge will have three spans.

Salina, Atlanta & Raymond.

A correspondent informs us that the construction of the whole of this road is under contract. The line of the road is from Salina, Kan. (on the Kansas Pacific, 185 miles west of Kansas City), southwest to Raymond, on the Atchison, Topeka & Santa Fe road, in Rice County. The road will be 74 miles long. The grading and masonry of about 25 miles of the line southwest from Salina are completed, some 18 miles of the grading having been done by a company known as the Republican, Salina & Arkansas Valley. A large force is at work on the grading through McPherson County.

Central of New Jersey.

The second track on the Lehigh and Susquehanna Division is nearly finished from Easton to Allentown, 17 miles, only a quarter of a mile of track remaining to be laid.

Mansfield, Coldwater & Lake Michigan.

It is reported that orders have been given to iron the unfinished section, and that work has been commenced west of Fostoria, O. The unfinished section is from Tiffin, O., northwest to Monteith, Mich.

Rochester & State Line.

A committee on behalf of the Citizens' Association of Rochester, N. Y., recently made an inspection of the work along the whole line from Rochester, N. Y., to Salamanca, 107 miles. The grading and masonry on the whole line are well advanced and work is going forward rapidly, some 1,500 men being at work on the road. The application for an injunction, which had been made by the Citizens' Association, to restrain the city of Rochester from issuing the \$100,000 of bonds voted to the

company was withdrawn on receiving the report of the committee. Pending the application for the injunction, however, the company had procured from other sources the money needed to meet the monthly payments to the contractors.

A correspondent informs us that William McRae, Patrick Laineen and Michael Lally, of Lockport, N. Y., who, under the firm name of McRae & Co., were sub-contractors under Messrs. Slocom, the general contractors, recently absconded to Canada after receiving nearly \$20,000, their full monthly estimate, leaving their men unpaid and numerous other debts.

Des Moines & Ames.

The line of this road is now being located and the right of way secured. The road is to extend from Des Moines, Ia., north about 30 miles to Ames on the Chicago & Northwestern, and, we believe, is to be of three-foot gauge. It was partly graded some years ago.

Peoria & Fond du Lac.

A narrow-gauge railroad is proposed, to run from Peoria, Ill., northward to Fond du Lac, Wis., with a branch to Milwaukee. Such a road would be about 200 miles long.

Lehigh Valley.

The Philadelphia Ledger says:

"The Lehigh Valley Railroad Company on the 13th inst. executed a mortgage to the Fidelity Insurance and Trust Company, as trustees, for \$40,000,000, for the purpose of retiring the present outstanding debt and furnishing means for additional facilities demanded by the increased business of the company. The bonds are of the denomination of \$1,000 each, bear 6 per cent. interest, payable semi-annually in June and December, free of all tax, the bond to run fifty years, being redeemable in 1923. A condition stipulated is that the amount of the said bonds issued is not to exceed the amount of the capital of the company. A feature new to this description of investment security is a stipulation in the mortgage that if the holder of any bond or bonds shall elect, the company shall, within twenty years from date, upon the surrender of all coupons not then matured, stamp on the bonds the words 'payment of principal postponed,' and shall register the bond in the name of the then holder, and thereafter the holder shall not be required to receive nor the company to pay the principal of the bond until payment of the principal is demanded by the holder, after default in payment of interest; the interest, however, to be payable semi-annually, as expressed on the face of the bond until the principal shall become due and payable. These provisions authorize what may be termed an annuity bond. The present funded debt of the company is \$11,000,000—\$5,000,000 of which are 6 per cent. and \$6,000,000 7 per cent. bonds—to provide for the payment of which \$12,000,000 of the new 40,000,000 bonds are to be appropriated, and either exchanged for the old bonds or sold to provide means for their retirement. This new loan virtually authorizes an increase of the funded debt of the company \$23,000,000, though it is not contemplated to extend it to the ultimate limit named within the present generation, if ever."

Wisconsin Railway Company.
A company by this name has been formed in Milwaukee for the purpose of taking the St. Croix land grant, recently declined by the Milwaukee & St. Paul, and building the roads required in order to obtain the grant. Mr. John W. Cary, Attorney for the Milwaukee & St. Paul Company, is President of the new company. Immediately on the organization of the company a committee was appointed to wait upon the Governor of the State and make the necessary arrangements for securing the grant. The Governor, however, required security to be given, as provided by act of the Legislature, for the payment of a forfeit of \$5,000 per mile for every mile of road which might not be completed within the time named in the act. This forfeiture applies only to the main line of the St. Croix & Superior road, 60 miles of which must be built this season. The company has not yet decided whether to give the required security.

Many rumors are afloat concerning the company. It is reported that it would be backed by the Milwaukee & St. Paul, but it is also reported that it was organized at the instance of that company in order to prevent the North Wisconsin Company from obtaining the grant.

Jacksonville, Pensacola & Mobile.

In a suit as to the ownership of the Monticello Branch (which extends from the main line north four miles to Monticello, Fla.) before the Florida Circuit Court in Tallahassee, it was decided that this road was not subject to sale by the Trustees of the Internal Improvement Fund; that the sale by them of the Pensacola & Georgia road did not pass title to the purchasers, and that the title of the branch road was conveyed to John McGehee as trustee for the holders of the free land bonds, and is subject to said bonds.

Des Moines Valley.

A dispatch from Des Moines, Ia., dated June 21, says: "The execution for the sale of the Des Moines Valley Railway was issued yesterday, and afterward recalled in consequence of a doubt as to its legality."

Southern Pacific of California.

The Sacramento (Cal.) Record says: "The engineers of the Southern Pacific Railroad Company are running a preliminary line in Los Angeles County, from Florence station to Anaheim, by way of Gallatin. Two lines have been run from Florence to Gallatin, and the permanent route has not yet been decided upon."

Memphis, El Paso & Pacific.

It is reported that the representatives of the French bondholders have finally arranged a compromise with the Texas & Pacific company upon the following terms: For each share of the value of \$100, the holder is to receive a title to thirteen acres of the Texas land grant, or 75 per cent. in Texas & Pacific bonds, payable within five years, or 33 per cent. cash.

Grand Rapids, Newaygo & Lake Shore.

At the annual meeting of this company in Grand Rapids, Mich., June 19, it was stated that the right of way for the extension north of Newaygo was secured, and that ten miles of this extension would probably be built this season.

A resolution authorizing the lease of the road to responsible parties was adopted by the stockholders.

Washington City, Virginia Midland & Great Southern.

The grading of the extension from Lynchburg to Danville is now substantially completed, and the road is ready for the iron.

Delaware River & Lancaster.

The engineers of this road have received orders to complete the location of the road at once, and it is said that contracts will shortly be let. The road is to extend from Lancaster, Pa., northeast to the Delaware River, in Bucks County, where it is proposed to connect with the National road.

Baltimore & Potomac.

The work of track-laying in the tunnel connecting this road with the Northern Central in Baltimore is progressing rapidly. It is expected that trains will begin to run to and from the Calvert street Station about July 1.

Washington & Point Lookout.

This company has commenced to build two branches from the point where its road will cross the line of the District of Columbia. The two branches together will form a line from

the Washington Branch of the Baltimore & Ohio, at Hyattsville, to the Potomac opposite Alexandria. These branches, when completed, are to be leased by the Baltimore & Ohio Company, at a rental of \$36,000 per annum. The company will issue 6 per cent. mortgage bonds to the amount of \$544,000 on these branches, which will be about 12 miles long.

Cairo & St. Louis.

Trains now run from East St. Louis instead of East Carondelet, as formerly. Between these places the track of the East St. Louis, Cahokia & Falling Springs, a third rail being laid.

Delaware, Lackawanna & Western.

By the consolidation with the Lackawanna & Bloomsburg Company, \$1,126,750 of the Lackawanna & Bloomsburg stock came into the possession of this company, in addition to \$1,074,100 previously owned by it, making in all \$2,200,850 of this stock. The company also owned \$895,600 of its own stock, held in trust. At a meeting of the directors held in New York, June 23, the following resolutions were passed:

"Resolved, That the stock of this company be now issued to represent the said stock of the Lackawanna & Bloomsburg Railroad Company, and that it, and the said stock of this company now held in trust, be offered to stockholders at par in the ratio of one share to every seven shares by them respectively held on the 20th day of June instant, the same to be paid for at the office of the company, on or before the 5th day of July next."

"Resolved, That stockholders who do not pay for the stock allotted to them by the 5th day of July next, will be considered as declining to take it, and forfeit all right thereto."

"Resolved, That the transfer books be closed from 3 o'clock in the afternoon of the 20th day of this month until the morning of the 21st of July next."

The total amount of stock thus to be allotted is \$3,096,450, but there is no increase of the total capital stock made by this action.

Cayuga Lake.

A suit is now pending before the United States Court at Canandaigua, N. Y., to recover interest on bonds issued to this company by the town of Springport, N. Y. The bonds in question, amounting to \$100,000, were issued by the commissioners of the town of Springport, about two years since, an injunction being pending at the time. The Court of Appeals of New York recently decided that the bonds are null and void.

Blue Ridge.

A compromise between the contending creditors of this company has been made, and James P. Low and J. P. Sothern appointed assignees in bankruptcy. It is said that the road will be sold as soon as possible to parties who will complete it.

Sibley & Dakota.

This company, which recently filed its certificate of incorporation with the Secretary of State of Iowa, proposes to build a railroad and telegraph line from Sibley through Rock Rapids to the north or west line of Iowa, and thence upon the most practicable route through Dakota or Southern Minnesota and Dakota to some convenient point of connection with the Northern Pacific Railroad, not further west than the 113th meridian of longitude. The capital stock is to be \$600,000, with the right to increase to \$2,000,000.

Fort Wayne, Jackson & Saginaw.

The Jackson (Mich.) Citizen of June 17, says: "The result of the failure of the proposed consolidation of the Fort Wayne, Jackson & Saginaw, the Detroit, Hillsdale & Indiana and the Detroit, Eel River & Illinois companies is seen in the fact that freight from the south bound to Detroit, etc., now comes to this point again. During the provisional arrangement it left our line at Banker's and went eastward over the Detroit, Hillsdale & Indiana. Of course the main business of the line will be transacted here. The sleeping cars on the Indianapolis express, hitherto sent via Ypsilanti over the Detroit, Hillsdale & Indiana, will hereafter come out on the evening express to this point and will here be transferred to the Fort Wayne train."

It is said that this company has given orders to allow none of the Detroit, Eel River & Illinois trains to pass over the road from Auburn (the junction with the Eel River road) to Banker's.

Erie.

Much complaint is made all along the line with the present arrangement of trains. By the summer time-table the facilities for travel were decreased instead of being increased, as is usual in the summer. On the Newburg Branch, the morning and evening express between Newburg and New York was taken off and nearly all the commuters have since left the road and travel by the Hudson River road or by steamboats. On the Newark Branch, the travel has decreased more than one-half, and the same report is made from other points where there are competing lines.

A deputation from the Paterson Board of Trade recently had an interview with President Watson with reference to obtaining better facilities for travel and better station accommodation. The interview had no immediate results, though many promises were made for the future, when the gauge of the road should be changed. Paterson furnishes a larger amount of business to the road than any other station between New York and Buffalo, but the station accommodations, both freight and passenger business, are entirely insufficient, the passenger depot especially being simply disgraceful to the company.

Canton Company.

This company has authorized an issue of \$5,000,000 6 per cent. gold bonds, a portion of which, it is stated, are to be used in the purchase of a controlling interest in the Western Maryland Railroad. It is reported that the City of Baltimore, which owns a large interest in the road, is willing to sell that interest to the Canton Company for \$300,000, provided the latter company will complete the extension from Hagerstown to Williamsport.

Toronto, Grey & Bruce Railway.

The first train ran through to Owen Sound on the 14th of June. The road will not be formally opened for some time yet.

Missouri, Kansas & Texas.

This company having taken possession of the Hannibal & Central Missouri Railroad (Hannibal to Moberly, 70 miles) and having put in order its new Eastern Extension (Moberly to Sedalia, Mo., 53 miles) has made the two sections into a division called the "Eastern Division," with M. M. Towne, at Hannibal, as Division Superintendent.

The Louisiana Bridge.

The Kellogg Bridge Company, of Buffalo, is constructing for this bridge, which is being built for the use of the Chicago & Alton Railroad Company across the Mississippi at Louisiana, Mo., a pivot draw span 442 feet long over all, making two clear openings of 200 feet, also one span of 252 feet, and one span of 222 feet from center to center of piers. It is expected that these will be completed by November 1.

Stockton & Ione.

This company has completed a contract with H. B. Platt, of San Francisco, to build the road from Stockton, Cal., to Ione. Work is to be commenced as soon as \$100,000 is subscribed to the stock.

West Wisconsin.

It is said that this company intends to build a branch line from Eau Claire, Wis., northeast 12 miles to Chippewa Falls.